

THE MEDICAL NEWS.

A WEEKLY JOURNAL OF MEDICAL SCIENCE.

VOL. 82.

NEW YORK, SATURDAY, MAY 9, 1903.

No. 19.

SPECIAL ARTICLES.

MEDICAL EDUCATION IN THE UNITED STATES.*

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ONE of the chief objects of the organization of the American Medical Association was the elevation of the standard of medical education in the United States. In the president's address, the Father of the Association, Dr. N. S. Davis, stated that "the purpose of the organization was the improvement of our system of medical education and the direct advancement of medical science and practice."† That medical education in that day was defective, as recognized by the founders of the Association, is shown by the report of the Committee on Medical Education in the year 1850. The committee said, in part, as follows: "Medical education is defective because there are too many medical schools; the teachers are too few. There are too many students. The quantity of medicine taught is too limited; the quality too superficial, and the mode of bestowal of the honors of medicine too profuse and too unrestricted."

For many years the Association showed its interest in and attempted to influence the elevation of the standard of medical education through a committee on medical education. The Transactions of the Association of the earlier years show many reports of this committee, which display much thought and effort on the part of the Association to improve the status of medical education at that period of time. James R. Wood, as chairman of the committee, in the year 1858, recommended that the various medical colleges of America be requested to send delegates to a convention of medical colleges, to consider the matter of medical education. This movement finally resulted in the formation of the Association of American Medical Colleges, which thereafter represented, to a degree at least, the American Medical Association in its efforts to improve medical education. Later, the Southern Medical College Association was formed. Together these associations represent about 80 per cent. of the regular medical schools of the country, and these colleges have, in a general way at least, fulfilled the minimum requirements prescribed by the rules of the associations in regard to the preliminary education of students, the length of the college course, and the character of the curriculum.

About twenty-five years ago the Illinois State Board of Health, through the splendid efforts of Dr. J. H. Rauch, its secretary, made a report on the number and character of the medical schools of the country. This board adopted a minimum of requirements of medical schools as a necessary step toward the recognition of their diplomas by the State Board of Health of Illinois. This minimum requirement of the State Board of Health was gradually increased from time to time, with the result that many of the medical schools were obliged to raise the standard of medical education to enable their graduates to obtain licenses to practice in Illinois. Other states followed Illinois in requirements for better methods of medical education, with the result that the

standard of medical education in the country was very much improved.

Medical Schools of the Country.—In the earlier days of our country, the need of physicians was met by the organization of medical schools which were, as a rule, proprietary in character. These schools attempted the education of physicians on the then existing conditions of medicine by teaching, in a didactic way the principles and theories of medicine and surgery. The branches usually taught at that time consisted of anatomy, physiology, chemistry, materia medica, obstetrics, the practice of medicine and of surgery. But little opportunity was offered in the great majority of the schools for extensive, practical teaching in anatomy or chemistry, and but a moderate amount of clinical work in the so-called practical chairs. The course of medicine in the college consisted of two annual sessions of four or five months. The course was not graded. The student attended all the lectures and clinics taught during his first year, and the second year was a repetition of the first. This class of schools was rapidly increased in the course of time. The chief reasons therefor were the fact that it was recognized that a connection with a medical school was profitable, directly and indirectly. The prestige which the teacher enjoyed among the graduates and the laity brought him a remunerative consultation and private practice. In most of the states it was easy to incorporate and obtain a charter for a medical college. It cost comparatively little to conduct and maintain the institution. Lecture rooms were obtained at trifling cost. The dissecting room was not worthy of the name of a laboratory, and the chief expense in maintaining it was the cost of dissecting material, which was usually deficient in quantity and poor in quality. Medical schools were organized all over the country, without reference to the needs of the people. Medical education was prostituted. To obtain a sufficient number of students many institutions showed a most degraded disregard of the moral and mental qualifications of the matriculates. The income of the school was wholly derived from the tuition of students, and no applicant was turned away who had the cash with which to pay his way. To add to the facility of obtaining a medical college course, there were organized in some cities evening schools, the hours of college attendance occurring from 7 to 9 or 10 o'clock at night. These sundown institutions enabled the clerk, the street-car conductor, the janitor, and others employed during the day to obtain a medical degree.

In 1877 there were sixty-five medical schools in the United States. In 1882 this number had increased to 89, and 1901-2 to 156. The enrolment of students and the number of graduates have also increased, in spite of the fact that the requirements for matriculation and graduation have been increased. In 1882 there were* 14,934 matriculates, and this number was increased in 1901 to 26,417, and in 1902 to 27,501, an increase of about 100 per cent. in twenty years.

The number of graduates in 1882 was 4,115; in 1901, 5,444; in 1902, 5,002, an increase of about 25 per cent. in twenty years. If, in 1850, there were too many medical schools and too many students, what can we say of the condition to-day?

It has been estimated that there is an average of one

* Abstract of President's address, delivered at the Fifty-fourth Annual Session of the American Medical Association, at New Orleans, May 3 to 8, 1903.

† Transactions A. M. A., Vol. XVI, 1865.

* The Journal A. M. A., Vol. XXXIX, No. 10, p. 574.

physician to 600 of the population of the United States at the present time. The natural increase in the population of the country, and the deaths in the ranks of the profession, make room each year for about 3,000 physicians, based on the proportion of one physician to 600 of the population. With 5,000 or more graduates each year, a surplus of 2,000 physicians is thrown on the profession, overcrowding it, and steadily reducing the opportunities of those already in the profession to acquire a livelihood. The evil of an overcrowded profession is a sufficient cause of complaint, but the cause thereof is the important point for us to consider and, if possible, remove. To correct the evil, the ease and facility with which a medical degree may be secured in this country must be diminished. As before stated, there are now 156 medical schools in this country. Of these, 30 are sectarian, and 126 are so-called regular schools. Fifty-eight are medical departments of universities, of which 24 are state institutions. The relation of the medical school to the university in most instances is a nominal one only. In but few of them is the control of the faculty, or the finances of the medical department, vested in the university proper. In a very few of them the sciences fundamental to medicine are taught in the university.

Scientific Medicine.—The great and important discoveries of Pasteur and the practical methods devised by Koch in bacteriology marked a new era in medicine. Before the facts made clear by these discoveries, the hypotheses and theories of other days have disappeared. Our knowledge of man and the lower animals and of the diseases and evils which afflict them has been revolutionized within the last twenty years. The advance in medical knowledge has been greater in that period than in all preceding time.

Methods of Medical Education.—The phenomenal evolution of medicine has multiplied the subjects of medical study. The character of these sciences requires that they shall be taught by the laboratory method. The laboratory method, too, has been adopted as the chief method of instruction in anatomy, pharmacology and chemistry, formerly almost wholly taught in medical schools by didactic lectures. The laboratory method, while necessary to the proper and practical instruction of the student, involves an expense which is appalling when compared with the methods of teaching formerly practised in all schools, and still adhered to in many medical schools. The method is expensive, inasmuch as it involves more extensive buildings, much expensive apparatus and an increase of the teaching force. The instruction must be individual or to small groups of laboratory workers, and this involves also an extension of the time of instruction. A physician engaged in private practice can not possess and retain the general and technical knowledge necessary to enable him to teach one of the fundamental sciences properly, nor can he devote an adequate amount of time to it. The teachers of these fundamentals must be investigators in the province of their respective sciences. They must give their whole time to the instruction of students and to original investigation. The thoroughness and accuracy of the training of the special senses, and in experimenting, which a student will receive from such teachers in properly equipped laboratories, will make him keen in intellect and sound in judgment. His desire for knowledge will be stimulated by the atmosphere of his surroundings, and will awaken in him a consciousness that through him and his work the knowledge of the world will be increased and humanity benefited thereby. But teachers of this character must be paid salaries quite as large as the remuneration of professors in the departments of arts, literature and science. The salaries of such professors and of the corps of assistants

which the laboratory method implies make the cost of the university or college far beyond the income which could be derived from the tuition of students. I believe it has been estimated that the laboratory method of instruction, now followed by all first-class institutions of learning, costs annually from \$400 to \$500 per student. But, great as the cost seems, it must be conceded that the present status of medicine demands the thorough instruction of students in these fundamental studies. It matters not whether his future may be that of a teacher or a practitioner of medicine. In either event, he must apply his knowledge of the fundamental sciences to his work, and the result will depend on the thoroughness of his education.

Applied Medicine and Surgery.—To enable the student to utilize the knowledge of a thorough training in anatomy, physiology, chemistry, pharmacology, physiologic and physical chemistry, embryology, neurology and pathology, he should be afforded facilities of equal rank in clinical medicine and surgery. To supply the student with proper clinical facilities involves several important features. Special hospitals, which would be absolutely under the control of the medical school, would be necessary. The hospital should be constructed with a definite idea of teaching students and of making researches into the nature, causes and treatment of disease, as well as to care for a definite number of patients. Hospitals for general medicine, surgery and obstetrics would be essential. Such hospitals, with laboratories and equipped with instruments, apparatus and library, would cost for their building and maintenance a very large sum of money.

It would be most practical to make the clinical work of the third year a clinical drill and experimental course, given in the special hospitals, and assign the students of the fourth year to the general hospitals and to the clinical teachers who are in private practice. All the general hospitals and dispensaries controlled by the medical schools could be utilized in the fourth year for this purpose, and afford the student an abundance of clinical material and the benefit of the experience of many clinical teachers. Many of the assistants in the special hospitals, of the third year course, would doubtless engage ultimately in private practice, and would, because of their scientific attainments, make excellent clinical teachers in the fourth year. A medical school conducted on the high plane advocated must necessarily be under the control of a university. Such a medical school would cost an enormous amount of money, and this can be commanded only by the trustees of a university of the highest order. That the money for the purpose of establishing and maintaining university medical schools with research hospitals and university extension clinical courses will be forthcoming can not be doubted. The world is awake to the great discoveries recently made in medicine. The wealthy men of this country have had their interest aroused as never before in reference to the possibilities and benefits which medical investigation will give to mankind. They now recognize that they and all posterity will be benefited by every new fact discovered in medicine, and that physicians thoroughly and scientifically trained are necessary to conserve the health of the people.

Education Preliminary to Medical Study.—The subject of the educational requirements for matriculation in medical schools has been discussed at many meetings of this Association in its earlier years, and later by the college associations, by the American Academy of Medicine and also by the various State boards of health.

The requirements were at first lamentably low, and the efforts of the Committee on Education of the American Medical Association and of the college associations

had but little effect, because they possessed no legal power to control the schools.

We must admit, too, that there are medical schools of such a low educational grade that they have no right to demand of their matriculates as much even as a common school education. This fact that low-grade medical colleges exist is one of the most satisfactory explanations of the difficulty encountered in elevating the standard of preliminary requirements.

To get at the root of the matter the medical college must be brought up to the proper educational standard, and then, and then only, can be made a proper preliminary educational requirement.

University Medical College.—The present status of medical science requires and demands a university medical college course. By university medical college is meant a medical school which is directly connected with and a part of a university; the university fixing the requirements and controlling the admission of students to the medical department. The method of teaching both the fundamental and the clinical branches is on the principles outlined above. To properly prepare for such a course the student should have, as a minimum preparation, at least two years of study in a good college or university. The requirements to enter a good college or university would insure a sufficient knowledge of the ordinary school branches and also Latin or Greek. During the two years' course in college his time would be well spent in the study of English, French, German, mathematics, history, philosophy, physics, chemistry, general and organic, and qualitative analysis, comparative anatomy and general biology. The amount of time to be devoted to each of these subjects would be the same as that of students of general science, as arranged in all college curricula, with the exception of a much more thorough course in chemistry, biology, physics and comparative anatomy.

Outlook of Medical Education in the United States.—Medical education must advance to its proper level if it complies with the present status of the medical sciences and the demands which continued evolution in medicine promises.

What does this imply? It means that the private—the proprietary medical school which is conducted for commercial reasons must go. Acknowledge, as we must, the great value which the best of these schools have been to the profession and to the country, all such schools have lived past the time when they can be of value. The continuation of these institutions henceforth will be harmful. They can not command the money to build, equip and maintain the laboratories and hospitals which a proper and adequate medical education demands. In the past their graduates have furnished the many great and influential medical and surgical clinicians of this country. In former days a graduate poorly prepared has been able, by indefatigable labor and post-graduate work, to place himself in the front rank as a clinical physician and surgeon.

To-day medical science demands primary instruction to fit a man as an investigator and scientific physician. If not properly educated he can not grasp the great problems which medicine presents to-day as he did the more simple clinical facts which comprised the art of medicine and surgery a few years ago. In the future medicine must be taught in the large universities of the country and in the state universities which are situated in or near large cities, where an abundance of clinical material may be commanded.

The State university and the college which desires to teach medicine, and is so situated that it can not command clinical material, should confine itself to teaching the sciences fundamental to medicine. These should be taught as pure sciences, and should be included in

the course for the degree of S.B. A college or state university ambitious to teach the medical sciences can do so without great cost. To attempt to teach applied medicine without proper and adequate hospitals, and with an insufficient number of patients would be irrational, nor can they command the necessary funds with which to do it. From such colleges and state universities the students could go to the larger institutions which are able to furnish the proper facilities for teaching applied medicine and surgery.

The general hospitals of many of the cities, now used by proprietary schools, could be utilized as clinical schools for both undergraduate and post-graduate teaching, conducted by the clinical teachers in the existing proprietary schools. Indeed, these hospitals could be utilized as clinical university extension courses. Necessarily they would have to be under the control and direction of a university medical school.

How many schools may be necessary to educate the number of doctors of medicine required annually in the United States? The question one can not answer, but it is safe to say that 2,500 graduates annually will fully supply the demand. This would imply about 10,000 to 12,000 matriculates. A minimum number of twenty-five and a maximum number of thirty-five medical schools should offer sufficient facilities to educate 10,000 students. The various state universities and the colleges which offer adequate science courses would educate a great number of students in the fundamental branches, or in the first two years of the medical course.

Medical Reciprocity Between the States of the Union.

—The low requirements of some medical colleges, and the want of uniformity in the requirements for a license to practice in the different states, has resulted in a condition which entails much hardship on a physician who desires to remove from one and to engage in practice in another state. The rules of most State boards of medical examination and of health are so stringent that a physician or surgeon of years of experience and of acknowledged skill and education, and the specialist who may be renowned in his field of work, are obliged, like the recent graduate, to take an examination in all of the branches of medicine and surgery in order to secure a license to practice in the state of his adoption.

To correct this evil it has been suggested by a member of the American Medical Association, and concurred in by others, that a national board of medical examiners be organized; that the board hold examinations at different seasons of the year in the various large cities, and that the diploma so obtained shall be recognized as a license to practise in any one or all of the states and territories. The measure suggested seems to be practical and feasible.

In addition to this plan, it remains to be said that the degree granted by the future university medical school will be undoubtedly recognized as an evidence of fitness to practice in any state in the Union. When we shall have a less number of schools and annual graduates the various states may safely and rationally become more liberal and discriminating in the conduct of their office.

Influence of the American Medical Association.—The American Medical Association should maintain its interest in the elevation of the standard of medical education, one of the chief reasons of its organization. Its influence in former years was principally moral. This was of considerable value, for the reason chiefly of the high ideals of the founders and first members of the Association, who advocated and fought for a higher standard of medical education. In the future its influence should be manifold that of the past, for with the reorganization of the profession, the better methods of conducting its affairs, the increased aid

probably very large membership, and its great medical journal, it should wield a great influence for good.

As the direct agent by which the American Medical Association may exert its influence in the elevation and control of medical education, the Committee on Medical Colleges and Medical Education should be made permanent and should be given adequate power and sufficient annual appropriation to make its work effective.

This Association should, therefore, stand for, and should use its whole power to improve medical education in this country. It is said that we never exceed our ideals in practice, and that if we lower our ideals our conduct sinks to a lower level.

The American Medical Association should take as its ideal and standard of medical education the university medical college, with all the name implies in regard to the fundamental medical sciences, and to the clinical branches. It should use its influence to drive out of existence those proprietary medical schools, which are conducted solely as money-making institutions. These measures can not be accomplished at once; but medical science demands it, the profession demands it, the people demand it, and look to the American Medical Association as the chief influence which shall accomplish this end.

SOCIAL CONDITIONS IN AMERICA IN THEIR RELATION TO MEDICAL PROGRESS AND DISEASE.*

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ANOTHER spacious year with its varied channels of energy and activity in medicine has closed. While a faithful chronicle of the facts, data and achievements showing the progress of internal medicine for that brief period would have proved an appropriate topic, I have availed myself of the choice privilege granted by this Association of selecting my theme, and purpose to consider the subject of the relation of American social conditions to the progress of medicine and disease and the import of modern economic and professional tendencies in forecasting the immediate future.

While there are certain things and events common to all in our psychical and social development, enlightened society will grant that the larger events in American history, assuming that "the first duty of society is the preservation of life and the comfort of its units," have not been so much dominated by legislative authority and social customs as by the march of science, more particularly medical and hygienic. In a country as vast as ours, however, there could be no uniform law covering the details of results in matters medical. These have been in the past and will in the future vary somewhat with the climate, physical conditions, degree of culture and opportunities presented by the widely separated regions. As a consequence, in displaying proportions and the practical results of scattered sections, the final adjustment of their claims only becomes perceptible and appreciable in their broader and higher generalization. The whole range of American historic data and events indicates an imperishable foundation of scientific achievement, and furthermore establishes firmly a relationship between medicine and the scientific principles underlying social conditions and phenomena that is both positive and vital. As touching the American medical history of the long past, we can see the major advances and their influence on social laws and the progress of civilization, only by grouping data and established facts

and applying the process of generalization to these composite phenomena. In this connection it is to be regretted that our possession of unclassified facts is increasing with uncomfortable rapidity. A comparative and historic study of the medical literature of America, taking any of the older countries as a standard of comparison, in respect to this method of generalization, can scarcely prove even measurably satisfactory. Much of the history of native medicine is crude, and it were impossible to give it either crystallized or concrete form. Epoch-making discoveries and important, far-reaching scientific effort is justly the boast of the American profession. Systematic effort at a rigid classification of facts by the modern statistical method, however, has not been made, and only a partial scientific use of the ever-advancing events for the different historical periods has been attempted.

The concrete, comparative and historical method of study which alone furnishes a proper basis for generalization and serves to point out the relations of medicine to other human activities, would insure a wholly fresh treatment of the earlier medical annals of America. The physician in his economic or professional dealings has not followed his self-interest in comparison with his measure of enlightenment, to an equal extent with men in other lines of human activity, but the fruits of his unselfish labors are, when taken collectively, presented in the form of a heterogeneous mass of details. It should be recollected that it is only the larger events, the accurately grouped facts after the method of generalization to which I have referred, that go to make up the bulk of medical history and medical law. The practical results of the method of simple generalization would show clearly the final utility of medical and sanitary knowledge in the social universe and manifest its relation to everyday life. Obviously in a young republic like ours something must be allowed to propinquity—to nearness to a confusing and disordered mass of facts and phenomena.

It has been well said: "A landscape is beautiful because distance has reduced its chaos of details into order."

Those endeavoring to make a personal study of the medical and sanitary requirements of our insular possessions, more especially under new and changed conditions, can not hope to gain more than a fragmentary knowledge. Much important and accurate information touching the social, climatic and medical conditions and necessities, however, is available through the Division of Insular Affairs, in the War Department at Washington. It is clearly incumbent on the organized profession of the United States to undertake studies on a larger scale than that of individual effort. Moreover, the interrelations between tropical medicine and the sciences before alluded to, i.e., social and sanitary, is a question for the immediate future; thus step by step may we hope to erect a stairway that will lead to a new temple of knowledge.

The spirit of undue haste which characterizes our national life is nowhere better exemplified than in American medical literature, despite its many virtues, its broad, liberal spirit and freshness. Never, in American history, whether deliberately or unconsciously, has so much current literature been placed at the disposal of physicians. Too generally medical thought and opinion, which is not of necessity medical truth, finds literary expression. The obvious weakness of it all is an enforced tendency to waste one's time in reading matter which is unapproved by common opinion. Extending this thought, it may be questioned whether to carry views and ideas beyond the domain of existing knowledge does not hinder rather than facilitate progress.

There is a list of honor among American writers, and

*Abstract of an Address on Medicine delivered at the Fifty-fourth Annual Meeting of the American Medical Association, held at New Orleans, May 5 to 8, 1903.

it embraces authors whose literary product shows not only a sharp scrutiny of facts, but also the highest and most characteristic utterances in medicine. Indeed, the worth and power of American medical literature, either in its content or method, scarcely receives an unprejudiced estimate abroad.

In the field of letters we point with inordinate pride to the late Dr. Oliver Wendell Holmes, and our contemporary, Dr. S. Weir Mitchell. Fiction by medical authors lives and will live, in America.

America stands in need of further reform in medical education and the immediate establishment of one authority—one licensing body; and self-created schools must place themselves in a position in which they can worthily assist in the execution of a scheme of higher national medical education. Professional ascendancy in future will demand the creation of a homogeneous and adequate standard of qualification for entrance into medical schools.

The relation of social conditions to disease is a topic that is becoming more and more insistent with the reflections that are the natural accompaniment of advancing knowledge.

A backward look reveals an embryo nation steeped in an arduous task, the subjugation of a continent, at the expense of unceasing physical toil. This necessitated an open-air existence, which resulted in a vigorous, hardy race. Then followed the integration of frontier villages, of larger and smaller towns, and life meanwhile became brighter and more piquant. For long generations the abandonment of rural life, the changed habits of living, the enforced pursuit of new and less healthful callings, too often from motives of personal comfort and even social expediency, and the universal tendency to overcrowding in town populations, resulted in a modification of the character and incidence of all leading diseases. It goes without saying that respecting the effects of our social conditions and climate on disease, the particular standpoint of our fathers was radically different from that of their children. Floyd M. Crandall has recently directed forcible attention to the fact "that never have such radical changes been witnessed in the habits of life and in human diseases as those in this country during the last half century."

One point of common agreement is that as a result of the rapid advances in sanitation and improved methods of treatment, there has been a notable decrease in prevalence and fatality of most infective diseases, particularly those more or less fostered by overcrowding (e.g., phthisis, diphtheria, diarrheal diseases, etc.). Three well-defined classes, however, have, according to the census for the decade ending May 30, 1900, distinctly increased; they are cancer, affections of the kidneys and the degenerations, fatty and fibroid. Thus during an increase in the population of 50 per cent. in the United States, myocardial degenerations have increased 150 per cent. and certain types of chronic nephritis have also risen in frequency to nearly 200 per cent. The determination of the causes of this rapidly increasing frequency of these morbid states is clearly the task of the medical profession.

Respecting the degenerations—myocarditis, arteriosclerotic changes and kidney diseases—Crandall says: "The power of alcohol in the form of malt liquors to produce degenerate changes is so well known to pathologists that the conclusion is irresistible that the radical increase in these diseases comes largely from changed drinking habits."

The notable increase in these morbid conditions, however, is not due to a single cause, and substantial progress can not result from too much emphasis on any one agency whose undoubted potency remains undemonstrated.

It is probable that a more universal application of refined methods of diagnosis accounts in a measure at least for the apparent disparity in the number of cases of nephritis and myocardial degeneration in recent times as compared with the showing of older statistics.

The census between 1890 and 1900 indicates an increasing prevalence of two additional diseases, in respect to both of which progress in our knowledge has been slow and never encouraging. I refer to diabetes mellitus and lobar pneumonia. The census previously referred to indicates that chronic diabetes mellitus has nearly doubled in point of frequency in a single decade.

Pneumonia, like other acute infections that prevail epidemically, shows a wave-like character, on comparing different years for the same locality. Exclusive of epidemic outbreaks there is an evident tendency to a preponderating incidence in overcrowded districts, and among the impoverished classes. Thus the average mortality rate for four years in New York, taking the eight wards which are most densely populated, from the tabular list is 18 per cent.

The fourth, sixth, seventh, tenth, eleventh, thirteenth, fourteenth and seventeenth wards of New York city were embraced in this estimation. In contrast with the figures just given, eight wards representing the most sparsely settled portions of the city of New York (e.g., first, fifth, eighth, ninth, fifteenth, sixteenth, eighteenth and nineteenth) gave for the same period of four years an average mortality of 14.3 per cent. It was observed in the compilation of these mortality statistics that an elimination of the epidemic periods would make the differences in percentage dependent on the population somewhat greater.

In arranging the statistics for Philadelphia I have included only those wards in which the inhabitants were equally distributed throughout the entire ward. Per contra, wards having large area and a low population, per acre, but this population located in certain sections of the ward only, have not been included. Thus the following wards became available for the purpose of contrasting those giving the highest with others showing the lowest mortality: First, second, third, fourth, fifth, sixth, seventh, ninth, tenth, eleventh, twelfth, thirteenth, fourteenth, fifteenth, sixteenth, seventeenth, eighteenth, nineteenth, twentieth, twenty-eighth, twenty-ninth, thirtieth, thirty-first, thirty-second and thirty-seventh. The eighth ward was not included on account of being inhabited principally by a better-to-do class and on account of containing the Pennsylvania Hospital, the former condition lessening the liability of pneumonia, while the latter institution named would tend to increase the mortality from this disease since many of its patients come from the third, fourth, fifth and sixth wards.

The portion of the city west of the Schuylkill River was excluded from this computation for reasons similar to those just mentioned.

Out of the 25 wards included in our figures I have estimated a percentage of deaths from those showing the most dense population per acre, allowing for the location of hospitals, homes, etc. (e.g., second, third, fourth, seventh, thirteenth, seventeenth and nineteenth wards), and I find the percentage of deaths from pneumonia to be 12.8 per cent. Those wards showing less dense population, the first, ninth, tenth, sixteenth, twenty-eighth and thirty-second, gave an average of 9.5 per cent.

The second, third and fourth wards were occupied largely by foreigners (Italians, Russians) and showed the highest percentage of deaths from pneumonia, while the seventh ward, which contains a large colored population, also shows a very high death rate.

As shown by MacDougall's statistics, unfavorable oc-

cupational conditions probably have less effect in causing pneumonia than phthisis. In my own investigations it was observed that divisions of Philadelphia having an industrial population modestly though comfortably housed furnished a death rate but little in excess of that of the sections inhabited by the well-to-do. The whole subject of occupational diseases, eminently important to the medical world, is closely united with the social and economic conditions of the wage-earning classes, but its consideration here would lead me too far afield.

CANCER AND IMMUNITY.*

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ON such occasions as this we take great pleasure in recalling the past and dwell with great delight on the achievements along the lines that have most engaged our attention. We, as surgeons, especially those whose professional activity began in the pre-antiseptic period, review the successive changes from that period of expectancy to the present period of aseptic accuracy with the greatest satisfaction. No one can fully appreciate the present status of surgery who is not personally familiar with the period when wound complications were the rule and when faith was pinned on the belief in "laudable pus."

However great the change has been in surgical mortality, in the great improvement in wound repair and in the comparative freedom from wound complications at present, when we consider the number of diseases treated surgically, we must confess that many problems remain unsolved. We are not prepared to say, even now, as Boyer did in his great work. *Traite des Maladies Chirurgicales* (1814-1822), that he believed that surgery had reached perfection. The great advances of the past have taught us the imperfections of the present and have pointed out to us the lines of research for the future.

At the outset, we are not unconscious of the fact that the profession itself is not yet agreed on many well-founded propositions. Many still cling with too much tenacity to old and deeply-rooted doctrines. Progress has been so rapid. The surgeon has, perhaps, been in advance of the physician along scientific and practical lines. The physician has observed that the surgeon has gradually invaded his field, thus creating some antagonism, but it has become less apparent and more cooperation has been the rule since bedside observation and a clearer pathology have demonstrated the actual conditions.

In this connection, we are convinced that there is still too much difference of opinion between the physician and the surgeon regarding the so-called borderland cases. In that class of affections which primarily are so-called medical, and later may become surgical, in which the early stages are obscure, where no positive diagnosis can be made, where there is no improvement from the usual internal treatment, these constitute a class where an exploratory incision would not only make a diagnosis clear, but would frequently lead to a cure.

Still, too much time is wasted in the medicinal treatment of such affections as goiter, tubercular lymph nodes, pulmonary abscesses and gangrene, empyema, abscesses and tumors of the liver, obstruction of the biliary passages, diseases of the pancreas and tubercular peritonitis. Chronic Bright's disease and ascites due to hepatic affections, always believed to be purely medical, have recently received the attention of surgeons

and the success has been sufficient to give much encouragement. The foregoing constitute a class of borderland cases in which it is often impossible to state where medical management ends and where surgical treatment begins.

Surgical advancement in the future will not consist so much in the radical changes in operative technique as in improvement in diagnosis and diagnostic aids. Many of our diagnostic formulæ are even now undergoing complete changes, and the future will lead us to a precision in the recognition of disease that we little dream of now. The early recognition of malignant disease is a problem of future development, especially malignancy affecting the internal organs. With our present aids it is impossible to recognize internal cancers sufficiently early to do a radical operation. Our only course at the present is an exploratory incision as soon as reasonable grounds for malignancy exist.

The field that seems full of promise and gives us hopes for great expectations in the future is that of immunity and immunization. It now seems that many tissue changes will be solved along these lines.

From our present viewpoint the question of immunity seems to tower above and overshadow all others. It involves the greatest problems for the future investigator to solve. Out of these researches will be evolved methods for the exact treatment of that great list of surgical affections which, at present, we can fortunately, to a great measure, avoid by exact asepsis and can control, to a great extent, by antiseptic measures when once developed. But we still stand helpless in the presence of severe forms of septicemia, pyemia, tetanus and other toxic invasions. Infections sometimes occur after the most carefully executed operative procedures. Accidental infections will always comprise a large proportion of our surgical material, a group of cases that furnishes a fatality all too great.

Our present helplessness in the presence of extreme toxemia, we must confess, lies in our imperfect knowledge of the exact conditions under which the toxins operate. We may say, in a general way, that toxic bodies attack and destroy cellular elements. When, however, we study this question of infection in a more serious manner, we find that a flood of light has been thrown on this problem by Ehrlich and his followers.

The two greatest problems of the future, cancer and immunity, shall engage our attention to-day. Malignant disease seems to be on the increase. We stand so helpless in its presence when fully developed that we exert our feeble energies and grasp eagerly for any fact that seems to offer new light for its better understanding. It will be our effort at this time to, as briefly as possible, review the more important facts known regarding the etiology of cancer and then, after making clear to ourselves the revelations thus far made in the recent studies of immunity, determining, if possible, what relations, if any, exist between the two.

These considerations were prompted by personal observations made in a number of cases of undoubted malignancy that indicated the probable infectiousness of cancer. It is well known to us all that the infectiousness of most infectious diseases was first determined clinically and that the clinical observations were later determined and confirmed microscopically and experimentally. The cases to be here related came under the author's personal care, and it is hoped that they may serve as contributory evidence to the observations already recorded by others that *malignant disease, under certain conditions, is infectious.*

Case 1.—Mrs. H., aged forty years, of spare build, very small amount of adipose tissue, presented in the outer and upper quadrant of the left breast a hard, nodular, painful, movable, walnut-sized growth, of one

* Oration in Surgery, delivered at the Fifty-fourth Annual Meeting of the American Medical Association, held at New Orleans, May 5 to 8, 1903.

year's duration. In the axilla could be felt a hazelnut-sized nodule. She had frequent lancinating radiating pains in the breast. There were no evidences of acute or subacute inflammatory signs, no local redness or elevation of temperature. The clinical diagnosis of cancer of the breast was made and a radical operation was advised. Various family matters prevented her from submitting to an immediate operation, so that several months passed, after which it was observed that the neoplasm had diminished in size and it finally disappeared.

It may be urged that this may not have been a cancer or that no one should make a diagnosis unless there be a confirmation by the microscope. Is the microscope always certain? We have all observed cases that ran a clinical course of malignancy after the microscopic findings indicated benignancy, and vice versa. The pathologist always inquires after the clinical features. He is disinclined to give an opinion unless he can know something of the history and symptomatology. The above case, in every detail, resembled many others that were demonstrated microscopically to be malignant, consequently it would appear that we are justified in the clinical diagnosis of cancer.

Case II.—Mrs. J., age thirty-five years, presented herself with an inoperable, extensively ulcerating carcinoma, involving the outer half of the right breast. The breast was unusually large. The outer portion of the ulcerating surface had been in constant contact with the upper and inner side of the arm. Portions from both breast and arm were removed for microscopic examination and proved to be alveolar carcinoma. No operation. She died in three months.

Case III.—Mrs. D., age thirty-five years. She came under observation with a typical epithelioma of the cervix uteri. The vagina was large and relaxed, so that the neoplasm rested in contact with the lower portion of the posterior vaginal wall. Hysterectomy was recommended, but was refused. She presented herself again in two months, in which time there had developed an epithelioma at the point of contact between the cervical growth and the posterior vaginal wall. An operation was done, but the patient died from recurrence eight months later.

Case IV.—Mrs. G., age forty-five years. Came under observation with a typical cauliflower growth involving the cervix uteri. Small particles were removed, which proved, microscopically, to be carcinoma. The uterus was fixed, the growth appearing to be too extensive for operative interference. No operation was advised. After several months the neoplasm became smaller and gradually disappeared, the uterus becoming movable. At the present time, eight years later, she appears well.

Here we have four cases of undoubted cancer, each one of which presented some of the features of an infection, as in lupus or syphilis. Cancer is extremely slow in its development, its premalignant stage often lasting many years. This fact possibly may account for the negative outcome of inoculative experiments hitherto conducted. This long developmental stage is not unlike lupus, leprosy and other forms of undoubted infection. In two of our cases we observed secondary growths which appeared at points where the primary neoplasm was brought, more or less continuously, in contact with previously healthy surfaces, a very common occurrence in nearly all forms of infection. In two of our cases the neoplasm disappeared spontaneously, the disappearance depending, no doubt, on some form of katabolism not yet understood. The elucidation of this form of cytomorphosis will give the key to the control, inhibition and elimination of the atypical cell proliferation which constitutes malignancy.

The term cancer, so commonly employed, refers to

growths made up chiefly of epithelial cells. There is really no good reason why the term cancer should be limited to epithelial growths. Cancer signifies "crab." It was originally used to signify malignancy and meant connective tissue growths as well as those of epithelial origin. For our purpose at this time we will limit the term cancer to epithelial neoplasms and we will confine these considerations to its etiologic factors.

The mystery of its origin seems as deep almost as in the days when cellular pathology was unknown. No problem in pathology has received more thought and speculation, no subject has had bestowed on it more earnest effort and unremitting toil. Regarding its etiologic evidence we must confess that we have only a mass of negative proof. When observers believed that they had found the specific organisms, scores of workers in the same field soon demonstrated their error. So, to-day, we can only say that the evidence which shows what we do not know of the cause of cancer is voluminous, and we must admit that we know little of its etiology.

We know something of its cell characteristics. We know that malignant disease is essentially a cell proliferation that has, biologically, many features that are opposed to the physiological "tissues in which they take their origin. We find an atypical life history in the cancer cells. The nucleus divides in an asymmetrical way. We note that unusual karyokinetic figures in the nucleus are usual in new growths, pointing to changes in the cellular life history. Regarding carcinoma, certain bodies have been demonstrated, believed by some to be parasites, having some causal relation to the cell changes.

It is a well-established fact that the nucleus perpetuates the nature and function of the cell, and any change in the nucleus changes the cell in its function and process of division. According to W. V. Shaw, "the growth of cancer cells is then to be looked on as an effort of reproduction in damaged tissue, the incidence of the damage falling on the nuclear structures."*

This statement is based on observations made by him in connection with experiments on free swimming larvæ which developed from the stimulation of ova of certain lowly organized animals, causing a proliferation of cells. The ova had not been fertilized by spermatozoa. Adult organisms were not developed, but larvæ capable of independent life. These results were obtained by stimulating the ova with strychnia and by mechanical movements of the ova. This cell growth was compared to the growth of tissue in partially damaged structures. Shaw believes that such damage alters the nature of these cell structures so that the vegetative functions of the cell run riot and the cells become parasitic toward the organism in which the growth is taking place. This view seems to find support in those connective tissue growths that develop in tissues that have sustained a trauma and in which the sarcoma develops; or in epithelial growths that form on surfaces that have been subject to prolonged irritation, as exemplified by the chimney-sweep's and paraffin-worker's cancer forming on an old chronic dermatitis; or a cancer forming on the site of a prolonged irritation by the smoker's pipe-stem on the lower lip. We have seen many times that cancer develops in epithelial tissue that has been subjected to irritation for a long time, usually extending over a period of years. We have long recognized irritation to be at least one of the causative factors. Just what metabolic disturbances take place and what the underlying causes are, is not yet clear. That cancer is infectious has been proven by many clinical observations. This has been shown by Eberth, who collected 22 cases where cancer was transmitted from lip

* The Lancet, Sept. 20, 1902.

to lip, tongue and palate. Behla reported eight instances of death from malignant growths in physicians and surgeons who were inoculated from tumors and four instances of apparent human infection from cancerous animals, dog and hen. He also alludes to a cancer epidemic among the white mice in the Pathological Institute at Freiburg as evidence of the contagiousness of cancer (Hektoen). Roswell Park believes that, for New York State at least, cancer is increasing at an alarming rate.

Attempts have been made to show that cancer is endemic, peculiar to certain localities. Behla cites cases of Behrens, who found in a village ten deaths out of thirty eight to be due to cancer. Pfeiffer, Powers and Friesinger maintain that in certain houses (cancer houses) and marshy districts in the vicinity of ditches and streams containing sluggish water, especially if the stagnant and polluted water were used for watering garden vegetables and for drinking purposes, cancer is relatively frequent (Hektoen). This would point rather to a microphyte than to a microzoon as the etiologic factor.

Since infection of living tissue is believed in every instance to be due to bacterial invasion, naturally bacteriologists directed their attention toward the discovery of a specific germ. Very soon we had a long list to enumerate. Plimmer of London examined in six years 1,298 carcinomata, and in 1,130 he believed that he found parasitic bodies. Sjöbring laid much stress on cell inclusions. Russell described his fuchsin bodies, which were spherical or oval. L. Pfeiffer of Weimar published several monographs on the protozoa as a cause of cancer. Eisen brought out his *Cancris amaba*. Korotneff believed that he had found an organism which he termed *Rhopalocephalus carcinomatosus*. Bosr found and described an organism that he called *Myxosporidia coccidia*. Gaylord of Buffalo described at great length bodies that he believed bore an etiologic relation to cancer. Sanfelice of the University of Cagliari emphasized the etiologic importance of bodies that he named *Saccharomyces neoformans*. A very large number of other publications on this subject made their appearance, none of which differed in any essential point from those bodies just mentioned.

While the presence of the aforesaid bodies described by the different observers can be demonstrated and are present in a large proportion of the cases of cancer, all the requirements necessary to prove them to be organisms solely responsible for cancer have not been fulfilled. The requirements necessary are (1) the organism must be isolated; (2) a cancer must be produced when the organism is introduced into another body; (3) the organism must be recovered from the cancer produced. It has been shown that, while the first requirement has only apparently been fulfilled, the second has been, in a number of cases, seemingly produced. More careful investigations have proven that the experimental growths were not cancer. The third requirement has not been fulfilled.

All of the work mentioned above was carefully reviewed in all its details by the cancer committee, who, in their second annual report to the surgical department of the Harvard Medical School, showed conclusively that the bodies described by the various investigators under different names were not cancer nor the cause of cancer. I can do no better than to quote in full the results of their labors. They bear the marks of painstaking and conscientious work. The conclusions of the Harvard cancer committee were written by Edward H. Nichols and were as follows:

"It has been claimed by the adherents of the theory of the parasitic origin of cancer that

1. A proliferation of epithelial cells analogous to the

lesions seen in cancerous tumors can be produced by certain well-known protozoa (nodules caused by the *Coccidium oviforme*).

2. Certain skin lesions characterized by epithelial cell proliferation are due to the action of a so-called protozoon (*Molluscum contagiosum*).

3. Blastomycetes are constantly present in human cancers and are the cause of the lesion.

4. By experimental inoculation of animals with blastomycetes, true epithelial or cancerous nodules can be produced.

5. Finally, the well-known endocellular bodies seen in the protoplasm of cancer cells have a definite morphology, are parasites and the cause of cancer.

It has been the object of the investigators, the results of whose work appear in the preceding pages, to study each of these questions. As a result of the lines of work pursued by them under the direction of the Cancer Commission during the past year, it is concluded that:

1. The lesion produced by the *Coccidium oviforme* is essentially a process of chronic inflammation and is not analogous to the lesion seen in cancer.

2. The lesion of *Molluscum contagiosum* is characterized by certain changes in the epidermis, is not due to the action of a protozoon and is not analogous to cancer.

3. The so-called 'blastomycetes' (*saccharomycetes*) of Sanfelice and Plimmer are torulae.

4. The lesions produced by these 'blastomycetes' (torulae) are, essentially, nodules of peculiar granulation tissue, are not cancerous, nor, in any sense, true tumors.

5. Blastomycetes are not constantly present in human cancers.

6. The peculiar bodies seen in the protoplasm of a cancer cell are not parasites, nor the cause of the lesion, but probably are, in part at least, atypical stages of the process of secretion by glandular epithelium."

It is clear that in the present status of the etiology of cancer, bacteriologically considered, the case has not been proven. But it does not follow that it will not be shown that cancer is due to a specific and well-defined organism. It may be an organism so minute as not to have been brought within range of the microscope. It is possible that no stains have yet been found that possess the requisite affinity for its complex molecular constitution. The necessary artificial medium for its cultivation remains for some future investigator to solve. Be it what it may, since the clinical features give strong evidence of the infectiousness of cancer, the search must and will be continued along the same lines.

In this search for a specific contagium, cellular metabolism must not be forgotten. Its consideration and study is perhaps more important than the isolation of a specific germ. It can not be denied that the more exact our knowledge of cytomorphosis becomes the clearer will be our understanding of cell proliferation. It has long been understood that there must be certain stimuli that cause cell growth and certain inhibitors that limit cell development and exercise control in accordance with the requirements of the tissues. Certain other influences bring about a disturbance of the normal equilibrium between the stimuli and the inhibitors. It is evident that the exact nature of the stimuli, the inhibitors, and the disturbers must be ascertained. This involves a study of the cell constituents and the fluids that surround it. As we see, it is a question of chemistry.

In this connection, it is important to take note of a very novel hypothesis bearing on the formation of new growths propounded by Homer Wakefield.

He believes that a neoplastic formation is not an exaggeration of anabolism, increased or excessive prolif-

eration, but that it is a product of katabolic stasis; that is, normal cell division is unimpaired, the anabolic process continuing to the point of maturity of the cell. It attains the meridian in its life and reaches the post-meridian state when it should undergo normal katabolism, a complete dissolution and disappearance of the cell. Instead, something has supervened to check katabolic changes, the cell becomes superannuated and its existence is prolonged until finally it undergoes various degenerative changes. Normal cell production continues, but normal cell dissolution is retarded or abolished, hence the cells accumulate, producing the appearance of what is regarded as cell proliferation.

This condition Wakefield has termed katabolic stasis or subkatabolism. He states that the intercellular substance is richly alkaline and that the tissue cells are more or less soluble in it. The cells, during the period of their growth, generate sarcolactic acid and during this period they are richest in protoplasm. After the meridian the cells offer decreased resistance to the solvent powders of the alkaline medium and lose their protoplasm, the nucleus alone remaining.

He infers that, before the meridian is reached, the acidity produced by normal cellular activity protects the cells by its neutralizing effects on the intercellular alkalies and that this preserves the investment of protoplasm. Now, if from any cause, the normal alkalies of the intercellular substance is reduced or if, in a given area, the acidity increases, katabolic stasis affects all the cells in that area. Suboxidation consequently takes place. It is therefore believed that cancer formation is an acid process.

Briefly, tumor formation, according to this hypothesis, rests on a stasis of katabolism, subkatabolism and suboxidation, in the presence of normal anabolism. The cell inclusions, observed by many investigators and regarded by them as protozoa, cancer parasites and as blastomycetes, Wakefield regards as products of disturbed nuclear division. This new hypothesis, at present, rests only on theoretical grounds, but the arguments are so thoughtful and so suggestive that they deserve careful attention. Their chief importance, at this time, consists in the bearing out and support of the methods of research along chemical lines.

We are all familiar with Virchow and the birth of cellular pathology, with Ehrenburg and the growth of bacteriology, and now we have arrived at, and are in, the humoral or chemical era. The trend of all research at the present time is beyond cells and beyond bacteria. It is to determine the chemical operations in and around the cells. This line of research began in the leucocytes because they were the most available. In their study it was possible to establish basic principles. From the leucocytes to the erythrocytes was only a step and then the epithelial and connective tissue cells received attention. This field of research is a new one. It is occupied by a vast army of patient and earnest toilers. The fruits of their labors will be beyond our greatest expectations. It is our present purpose to see if the cancer problem can be solved along these lines.

What has malignant disease to do with immunity? The entire subject of immunity has to do with infection. It has to do with its nature, mode of action and control. Has cancer any characteristics that pertain to infection? Bacteriologically we have found none. Clinically we have a mass of evidence that would seem to place cancer among the infectious diseases.

In order to have a clear understanding of the modern conception of immunity it is necessary to review as briefly as possible and in the barest outlines without comment the most important features of our present knowledge of the subject. Much material that may seem essential to a complete elucidation of this great

and important subject, had to be eliminated on account of the limited scope of this dissertation.

More than a century ago we find that John Hunter was familiar with some antiseptic properties of the blood. He found that a small amount of putrefying material could be added to a given quantity of fresh blood without producing putrefaction. Consequently, he advanced his doctrine of "the living principle of the blood." This, as an observation, was almost forgotten and its import was not fully realized until Nuttall, in 1888, began his systematic work in Flugge's laboratory, studying the antibacterial properties of the body fluids, especially the blood serum.

The greatest impetus to the study of immunity was given by Metschnikoff in calling attention to the participation of the leucocytes and other cells in the process of infection, establishing his well-known theory of phagocytosis. His views are so well understood that we need only to call attention to them at this time.

Following Nuttall, Pfeiffer discovered, in 1894, "the extracellular disintegration and solution of cholera spirilla in the peritoneal cavity of immunized guinea-pigs."

The greatest attention and interest was aroused by Behring's great discovery of antitoxic immunity. Bacteriologists at once endeavored to elucidate by elaborate researches the exact way in which immunity was established. Chief among these was Ehrlich. It was soon shown, however, that immunity in most bacterial infections did not depend, in the main, on the antitoxic principle.

Pfeiffer's phenomenon afforded a starting point from which Metschnikoff, Bordet, Ehrlich and Morgenroth began their labors and brought forth a series of discoveries that have been epoch making.

A series of antibodies were differentiated and classified as antitoxins, antienzymes, cytotoxins, agglutinins, precipitins and coagulins. Antibodies were in turn produced by these, with the exception of the antitoxins.

It was determined that to every cellular group of an animal species there appears to correspond a specific cytotoxin. These various toxins have been termed leucotoxin, neurotoxin, spermotoxin, nephrotoxin, thyrotoxin, etc.

These antibodies have been divided into two groups, first, the antitoxins which are single bodies; second, the cytolytins, whose antagonistic effects require the co-operation of two bodies.

Of these two bodies, the one which actually destroys the foreign cells is normally present in the cells or fluid of the organism, but it seems incapable of action without the intermediation of a body which is distinguished from it by a greater resistance to heat. The two elements composing cytolytins exist quite independently of each other so that one may be present without the other or be artificially removed without affecting the other.

To demonstrate the mode of action and constitution of the specific antibodies, Ehrlich has propounded the theory of receptors or side-chains. The atomic grouping of the toxin molecule, which affects the union with antitoxin as well as with a particular cell, he has designated as haptophore groups.

In view of the fact that certain molecule groups of the living protoplasm favor the taking up of certain poisons, he has termed them receptors. According to his theory of antitoxic formation; after the introduction of toxins, the receptors are produced in excess and finally are thrown into the blood as useless ballast. The free circulating receptors are the antitoxins, termed amboceptors, intermediary bodies. The action of antitoxins is explained thus. They take charge of the haptophore groups of the toxin molecules and prevent them

from approaching the receptors of the tissue.* There are as many receptors as there are toxins, while almost every day new ones are discovered.

Behring gives the most exact and brief definition of Ehrlich's antitoxin theory: "The same substance, which, when incorporated in the cells of the living body, is the pre-requisite and condition for an intoxication, becomes the means of cure when it exists in the circulating blood." Every antiserum protects only against substances through which it becomes immunized. Every antiamboceptor protects only against its particular amboceptor.

Ehrlich and Morgenroth found, in experiments with goat's blood, thirteen different new lysins which represent so many receptors. "The receptors are in the cells, not for the purpose of linking poisons to the cells, but to seize certain foodstuffs, particularly proteids, and the toxins, bacterial and other foreign cellular substances, if capable of inducing the immunizing reaction, chance to have the requisite combining affinities for the receptors."

The living body possesses bactericidal and cytolytic substances which may protect it by destruction of invaders or may injure it by destruction of its own cells, according to the mates with which they are paired.

In considering the physiological mechanism of the cells we find that they are designed, primarily, for the assimilation of food, and secondarily, to meet pathologic conditions, the production of antitoxins, cytolytins and other similar bodies. The receptors are in the cells for the purpose of taking up foodstuffs, chiefly, proteids. The toxins and bacterial cellular substances have combining affinities for the food receptors, if they are capable of inducing an immunizing reaction.

In producing immunization against bacteria, it is the intermediary body (amboceptor) which is generated. It has been found that these antibodies have a specific relation to the substances which caused their formation, as has been shown by the injection of a specific serum into an animal at certain intervals, of toxins, against which an antitoxin is desired.

The specific nature of these antibodies is further shown in their application to serum diagnosis, as shown by the Widal agglutination test for typhoid fever and the serum test in the diagnosis of bacillus dysenteriae Shiga, an organism shown to be the cause of acute dysenteries by Flexner, Vedder and Duval.

When Roux and Yersin discovered diphtheria antitoxin and Ehrlich the origin and mode of action of antitoxin, a lasting foundation for the study of immunity was laid. It was positively shown that "soluble toxins enter, as assimilable substances, into combination with constituents of the body cells for which they have an affinity," and are enabled to produce immunity or to exert toxic effects.

The expectations that we should soon be enabled to solve all questions regarding the action of toxins after the discovery of soluble bacterial toxins, have only partly been realized, especially regarding the action of the pyogenic micrococci, which concerns us most as surgeons.

However fruitless, hitherto, the practical results regarding toxins of many pathogenic and especially pyogenic organisms, the principle has been established, and it is only a question of method and time when all body toxins and their antitoxins shall be definitely known.

Pfeiffer directed his attention to the bacteria and found substances, toxins, in cholera spirilla, which became free only after the bacteria were dead and which were termed intracellular poisons. This was a most important step in advance, but we must acknowledge that we know

as yet very little about the action and nature of intracellular bacterial poisons.

It is interesting to note from the result of Flexner's experiments with venom that their action on red blood corpuscles, leucocytes and nerve cells is like that of duplex cytotoxins, which depend on the combination of intermediary bodies contained in the venom on one hand, with corresponding complements in the cells or fluids acted on. This is shown by the addition of venoms to fresh blood, which brings about the quick destruction of the red blood corpuscles. If the fresh blood has been washed with an isotonic salt solution, so as to remove all the complement, we find that the corpuscles are not dissolved, but agglutinated. It seems that the venom serves chiefly to bring "into necessary relations with constituents of the body cells, poisons we already harbor or may generate, but which are harmless without the intervention of intermediary bodies."

Flexner and Nogouchi have shown that the leucotoxic, the neurotoxic and other cytotoxic properties of venom depend on combinations of venom, intermediary bodies with complements contained in the cells poisoned by venom, or in the fluids bathing these cells, indicating that the snake venom contains only a part of the complete poison.

Flexner and Nogouchi also demonstrated that hemorrhages in various tissues of the body resulting from poisoning from certain venoms is due to the presence in venom of a cytotoxin which has the power to dissolve endothelial cells, which they termed endothelolysin (hemorrhagin). It causes extravasation of blood through its direct solvent action on capillary endothelium.

The hemolysins have been most extensively studied because of their great pathologic significance, and it has been found that many bacteria have hemolytic power. The secondary anemias, so constant in streptococcus infections, in pneumonia, typhoid fever and other diseases, afford a most striking example.

Normal blood serum contains antihemolysins which protect red blood cells from bacterial hemolytic agents. Associated with hemolysins are bacterial hemagglutinins, possessing the power to clump red corpuscles.*

Heuter and Klebs believed that thrombi were due to the coalescing of red blood corpuscles. Welch calls attention to hyaline thrombi formed by agglutinated red corpuscles. White corpuscles are agglutinated by certain bacteria and also by pus cells.

What is urgently needed is a separation of these poisons and a determination of their source, constitution, mode of action and degree of specificity.

It will not be out of place here to allude to the studies made of the ductless glands, because of their supposed bearing on immunity. Sajous urges that the adrenal extractives have a decided affinity for oxygen, offering a key to tissue respiration and to the functions of all other organs now classed as the ductless glands. It has been found that the red corpuscles are not the only carriers of oxygen, but that the blood plasma contains and distributes this gas. Schmiedeberg, Jacquet, Claud Bernard and others demonstrated the existence of an oxidation ferment in the plasma, and these bodies are now entertained as an oxygen-laden secretion. This secretion is believed to permeate nearly all the body elements. The blood also contains a fibrinogen body which combines in certain quantities with fixed portions of the plasma's oxygen. The changes in the temperature of the blood were traced to variations in the amount of the fibrinogen in the plasma. The adrenals have been shown to be connected with the anterior pituitary body by various sympathetic ganglia. The anterior pituitary body is regarded as the governing center

* Ehrlich: Schlussfolgerungen, p. 176.

* Heuter-Klebs, p. 731.

of the adrenal system. Overactivity of this body increases the adrenal secretion, consequently oxidation, therefore vital resistance. Depression of the activity of the pituitary body causes decreased supply of oxygen, consequently depressed vital processes.

The thyroid secretion, thyreoidin, has been shown to sustain the efficiency of the pituitary body. Excessive thyreoidin production stimulates the pituitary body and produces exophthalmic goiter. Deficient thyreoidin production leads to myxedema. The adrenals, the pituitary body and the thyroid gland constitute the adrenaal system. According to this line of research, it is believed that toxins act directly on the adrenal system, and, by decreasing or increasing its secretion, decrease or increase the oxidation process. Certain toxalbumins and many drugs stimulate the adrenal secretory powers to a certain limit, and, when exhibited in excessive doses, depress or arrest the functions of this system.

The posterior pituitary body has been shown by Berkley, Andriezen and others to be the chief functional center of the nervous system. It is the center for such emotions as shock, excitement, etc. It governs all organic functions through the nervous system. The secretions of the pancreas and spleen, according to Schiff, and later by Herzen, unite and change trypsinogen into trypsin, a solvent for the albuminous bodies in the pancreatic juice. This ferment performs an important part in immunizing processes, in that it destroys toxalbumins.

Viewing these labors in the light of Ehrlich's researches, the oxidizing substance represents the amboceptor; the splenopancreatic internal secretion, trypsin, represents his complement. To produce a proteolytic action of trypsin, fibrogen and the oxidizing substances are required. These views are somewhat at variance with those commonly accepted, but are of sufficient importance to deserve consideration in this connection.

From the foregoing it would seem that the doctrine of phagocytosis plays an unimportant rôle. But we find that the French, or phagocytic school, at head of which is Metschnikoff, recognizes the full significance of acquired immunity and the cytolytic principles represented by the co-operative action of intermediary bodies and complements. The German, or humoral school, led by Ehrlich, recognizes the leucocytes to the fullest extent.

The chief difference between the French and the German schools consists in the belief by the advocates of phagocytosis, that the complements reside in the leucocytes, whereas the adherents of the humoral school believe that they exist in the blood plasma.

While, in what has here preceded, we have been concerned in the consideration of chemical problems, we must not overlook the fact that behind all is a governing force which resides in the central nervous system.

The practical outcome of these studies has been found in the production of antitoxic sera, some of which have been proven to have a definite and exact effect under certain conditions. We find these sera divided into two principal groups, (1) those that have an anti-bacterial action, and (2) those that have a purely antitoxic action. Of all the sera the diphtheritic is best known. According to Welch the mortality of diphtheria has been reduced from 40 per cent. to 15 per cent. by its use.

Antitetanus serum has been disappointing. Reports coming to us from different sources are conflicting, the mortality ranging from 0 per cent. to 70 per cent. from practically the same methods, which consist in administering the serum by the subcutaneous, intracerebral and the spinal methods. Antityphoid serum has failed to fulfill expectations even more than antitetanus serum. The antistreptococcus serum of Marmorek, while it

seems to have exerted a specific effect in purely streptococcal infections, appears to exert no influence in the presence of mixed infections. The antipneumococcus serum has not yet emerged from the experimental stage. Nothing can be said of its effects. The anti-plague sera of Haffkine and Yersin demonstrated that, as a preventive, it reduced the number of cases to one-twentieth and the mortality in a given number of cases was reduced from 33 per cent. to 13 per cent. (Calmette). The antitubercle serum has been shown to have a specific effect on tuberculous tissue, but remains powerless in the presence of mixed infections. The antivenom serum has been demonstrated to have a positive usefulness in certain snake bites. Calmette's antivenin has been proven to be of undoubted use in leprosy.*

Many other sera have been described, but their usefulness thus far has been shown to be of an uncertain nature. Consequently, we will leave them out of consideration at this time.

When we pass in review all that is positively known in relation to the question of immunity, we can not deny that some of the principles underlying this great question have, in a measure at least, been revealed. The evidence is conclusive that "the same substance which, when incorporated in the cells of the living body, is the pre-requisite and condition for an intoxication, becomes the means of cure when it exists in the circulating fluid."†

Ehrlich, in his investigations of diphtheria toxins, demonstrated "that soluble toxins enter as assimilable substances into direct combination with constituents of the body cells for which they have an affinity, and only thereby are enabled to bring about immunity or to exert toxic effects." Further, in connection with Metschnikoff, Bordet, Morgenroth and Ehrlich, it is shown that "the organism possesses a power to produce substances specifically antagonistic to all sorts of foreign cells, cellular products and derivatives. The substances capable of inducing this immunizing reaction appears to be mainly of an assimilable, albuminous nature, or at least intimately associated with such material."

The principle of toxins and antitoxins has become as firmly established as any other in medicine or surgery. We have noted that antitoxins from pure cultures have a certain affinity for and possess immunizing power in specific infections, but fail in the presence of mixed infections. We see at once that failure to immunize does not violate the principle, but that the method of application has been at fault. We know that diphtheria toxin has a specific effect for the products of the Klebs-Loeffler bacillus, and that it controls and cures in the presence of these, but fails when there is an admixture of other forms of infection. This is shown by the 15 per cent. mortality which still exists. We have noted that antistreptococcus, tubercular and plague sera have a specific and a decided effect in pure infections, but that they fail in the presence of other specific germs. We observe with satisfaction the certainty of the action of a given antitoxin in its union with the toxin from which it was produced. It at once becomes apparent that, in the presence of several toxins or a mixed infection, it will require several antitoxic substances, a combination of antitoxic sera, or a serum containing different kinds of amboceptors, so combined as to meet and unite with the several toxins in a given case. Coley endeavored to meet such indications by combining streptococcus and bacillus prodigiousus sera in treating inoperable sarcoma.

These observations presage a revolution in therapeu-

* F. A. Packard and Robert M. Wilson: American Journal of the Medical Sciences, December, 1900.

† Behring's Definition of Ehrlich's Theory Concerning Antitoxin. Welch.

tics, which perforce means a refinement in diagnosis, beside which, what we do now will scarcely bear comparison.

The inferences to be drawn from the foregoing indicate that the future work will be biochemic. It appears that the solution of cell metamorphosis, as it is observed in pathologic conditions, will be in the field of chemistry. Ehrlich's theory of the side-chains has given us a working hypothesis almost as practical as the atomic theory when applied to chemistry. It is not an idle dream to believe that the revelations of the future will not only consist in a complete exposition of cells and body fluids, or a perfect understanding of the governing brain centers, but may extend to the life principle itself, although life itself may and will ever belong to the unknowable.

Our chief interest, however, will always center in the cell and its governing influence. Just what influences are responsible for normal cell division may never be known. But it is within the bounds of human possibility to know what influences may be responsible for atypical and excessive cell growth. Excessive cell growth, both in the leucocytes and connective tissue cells in acute infections, we can assume to be due to toxins that are in excess of the amboceptors. The existence of cytolytins and anticytolytins is now undisputed. The one destroys, the other protects the cells. We have noted that the chief function of a receptor molecule is to combine with nutrient molecules, a metabolic, a chemical process. The birth and growth of the cell is restricted within certain limitations and is regulated by chemical law. Now the problem depends on our ability to ascertain the exact influence that carries cell division beyond its normal bounds and causes excessive cell growth as we observe it in malignant new growths. That the process is one of localized excessive nutrition is apparent. The localities of predilection are frequently at points where the cellular elements are exposed to frequent insults, where the tissues are damaged, establishing a *locus minoris resistentiae*, as, for example, in the mouth, gastrointestinal tract and the female reproductive organs. A point of least resistance, damaged tissue, if you please, always offers a soil for bacterial invasion. Cancer very often develops in tissues that have long been irritated, no doubt liberating a complement that unites with a specific infection when introduced under proper conditions. Such is not always the case, however. In fact, we know that in the majority of tissues that sustain irritations and almost constant traumatism for many years never become malignant. The simple traumatism does not develop cancer. A specific toxin must be introduced, probably also an intermediary body to complete the side-chain, which increases karyokinetic energy. We have noted in our studies of immunity that the life or death of the cell depends on its intra- and extracellular composition, so we may say that the whole process, whether it relates to normal or excessive cell growth, is chemical.

An objection may be urged at this point, which consists of the fact that the propositions of immunization thus far considered affect groups of cells extending over a wide range, i.e., the vascular, the muscular and the glandular or cerebrospinal systems. It has been shown that cancer is always at the outset, and often throughout its entire course, absolutely a local disease. It would not seem rational to attempt immunization of the entire system against a strictly local disturbance. We will naturally turn our hope toward a method that will enable us to effect local immunization.

That local immunization is possible has been demonstrated by P. Römer in the following convincing abrin-immunization experiment. As is well known, abrin,

which is the toxalbumin of the jequirity bean, will produce a severe conjunctivitis in animals and men. Ehrlich had demonstrated that rabbit's conjunctivæ became immune after the instillation of abrin. Römer instilled into the right eye of the rabbit weak abrin solutions, the dosage being rapidly increased until immunization was produced. In three weeks the rabbit was killed. It was then shown that if the right conjunctivæ, which had undergone severe inflammation, were rubbed and macerated with a certain amount of abrin and injected into a healthy animal, the injection had no effect. But, if the conjunctiva of the left eye, which had received no instillation, were rubbed and macerated with abrin and injected into an animal, death always followed. Römer concluded from this observation that in conjunctival immunizations a part of the antitoxin existed in the conjunctiva itself. A local antitoxin was produced.

It would seem that these results establish definitely the principle of local immunization in indifferent tissues. These observations have an important bearing on the adaptation of the cells in local affections. That local affections of various forms or general affections with local manifestations, can be best managed by the local introduction of exceedingly small doses of the specific remedy, was shown by Professor Bouchard before a recent meeting of the Egyptian Congress. He found that articular rheumatism disappeared after the injection *in situ* of small doses of salicylic acid, in some cases only half a grain. We must conclude that local cell metabolism can be influenced by local rather than by general diffusion. The inhibition of excessive cell growth must be accomplished in the same way.

It would seem, then, that the cancer question must be solved along the lines of chemistry. Since we know that contagious or infectious energy does not depend on the bacterium itself, but on its products, which are purely chemical, it would seem that it matters little whether the specific parasite is found or not. Since the cancer germ has thus far successfully eluded the most vigilant search it becomes more and more evident that in the field of chemistry will be found the solution for our problem.

It will be difficult to rid ourselves of time-honored views. Purely theoretical speculation, like the hypothesis of cell proliferation from inclusions of embryonic matrices according to Cohnheim, must give way to the demands of modern science that insist on actual observations and practical demonstrations.

Now then, will it be unreasonable to hope, that when protoplasmic changes are thoroughly understood and when the body sera have given up their secrets and the influences that govern cell growth, that we may also find the antibodies which will inhibit cell multiplication beyond natural bounds?

The studies in the field of immunity have, as yet, only assumed the proportions of the initiatory stage. A vast unexplored wilderness lies before us. The pioneers have begun their work well. They have outfitted themselves in a manner that will, in the near future, enable them to throw unexpected light in the pathway of their conquest of discovery. They are only on the verge of this vast domain. What lies beyond the borders we can no more foretell than could Boyer know that in twenty-four years after his death we should have anesthesia and that in fifty years the world would have antiseptic surgery. And yet, in the light of our present knowledge the hope, amounting to a conviction, arises in us that even in our lifetime, if we are spared a few years more, we will have an exact biodynamic and biochemical science that will make diagnosis accurate and precise and one that will enable us to treat and control all infections with an exactness not now possible. While the surgeon is now constantly encroaching on

the field of the internist, the time is not far distant when the physician may not only reclaim his own, but with it that large group of neoplasms known as malignant growths that from time immemorial has been the exclusive property of the surgeon.

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ORIGINAL ARTICLES.

ON THE RESEMBLANCES OF MALIGNANT ENDOCARDITIS TO TYPHOID AND PARATYPHOID INFECTIONS.

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IN considering with you the subject of this paper, I am not unmindful of the voluminous literature which has accumulated on the infections of the endocardium during the past few years. I am prompted by my clinical and pathological experiences to call the attention of this Academy for the first time in its history to the resemblances which the disease bears to typhoid and paratyphoid infections. There are two facts which have impressed us. First,—the typhoid type of infectious malignant endocarditis has rarely been diagnosed during the life of the patient by those with whom we have seen these cases and second,—the detection of the focus from which infection sprang has presented the greatest difficulties. At times it was impossible to reach a satisfactory conclusion. Experience proves the force of this statement and the truth of these facts. We must remember that we are dealing with infection which is probably secondary; that all cases are not always dependent upon the same pathogenic organism and that the true nature of the infection can, as a rule, be determined only by painstaking bacteriologic study and repeated hem-

analyses. It is a question whether any other disease presents a richer development of bacteria in the blood. No primary infection is so mild that it may not ultimately give rise to grave and fatal endocarditis. In cases of the infection which are associated with a typhoid condition from the beginning, secondary endocarditis may stealthily develop without the change of a single original typhoid symptom. In some of these cases the physical signs referable to the heart are absent for a long time thus shading the diagnosis.

The malignant nature of the endocarditis often surprises us for in some cases the primary infection may remain unnoticed or may be so slight as to appear insignificant. In the endocarditis following profound infections one is impressed by the gravity of the primary disease and may be pardoned for failure to detect secondary and malignant disturbances.

In this paper I wish simply to draw deductions from recent clinical data gathered since the publication of my article in the *Jacobi Festschrift* in which I offered a classification of malignant endocarditis, based upon the symptomatology of this disease with which later experiences have made me thoroughly satisfied. Let us consider the following histories:

Case 1.—Walter J. B., aged forty-one years, electrician, was admitted to St. Joseph's Hospital Nov. 10, 1902. His father died at a ripe old age; his mother is living and well; he has one brother and two sisters living; one sister dead, cause of death unknown. There is no history of tuberculosis, carcinoma, rheumatism, neither is there specific or hereditary taint. Has been a daily user of alcohol. His previous history shows that he had always enjoyed good health, until 14 years ago when he sustained a serious injury to the perineum; from this he never recovered, but was always more or less troubled with urinary symptoms. After ten years of dysuria and cystitis, he was first forced to use a catheter four years ago; this was used by a physician and was followed by severe chills and fever.

Following this initial use of the catheter, he was forced from time to time to resort to its use for relief at intervals of from three to six months. Catheterization was usually followed by chills and a high temperature. This patient had an abiding faith in the treatment of stricture, from which he suffered, by electricity and for that purpose he vacillated between two physicians who at various times during the past two years, treated him with galvanism. On Oct. 31, of the last year an instrument (16 French) was passed by a physician into the urethra, and an electrical treatment was given. The physician stated that he had previously introduced a much larger instrument. On withdrawing it, he found a number of "vegetations," as he called them, attached; in all probability the urethra was ruptured and a portion of mucous membrane was withdrawn with the instrument. Following this the patient had chills and fever; became desperately ill and fell into a typhoid condition with a low mutter-

ing delirium. When conscious he complained of pain in the region of the heart. During the early days of his sickness between Oct. 31 and his admission to the hospital, he had repeated chills. Physical examination showed considerable emaciation. His muscles were flabby; the skin over the malar eminences flushed. He was apathetic most of the time. On his body were a large number of hemorrhagic spots, varying in size from a pin point to a split pea. Physical examination of the heart showed moderate increase of cardiac dullness to the left, with a marked blowing, systolic murmur, loudest in the mitral area but heard over the entire mammary region. There were no marked physical signs referable to the lung. The liver was slightly enlarged, as was also the spleen. During his stay in the hospital his temperature ranged from 100.2° to 104.8° F.; his pulse was never below 100, usually between 120 and 130; his respirations were between 28 and 36. There was albuminuria. Urine analysis: specific gravity 1.015, considerable pus, bacteria and urates. There was a marked leucocytosis, the count showing 31,250 white corpuscles in each cm. of blood. A single examination of the blood on Nov. 12, made by Dr. Steensland proved sterile. This patient went deeper into the typhoid condition as the disease progressed; the abdomen became more distended; the pulse more rapid; the delirium more marked until finally, three days after admission to the hospital, he died. Unfortunately a post-mortem was denied, but there can be no doubt, when we consider the physical signs, the previous history of the patient, the evidences of embolic infarct and the result of the blood count, that the patient died of a typhoid type of malignant endocarditis. The chills verify the conclusion that during the early days of the infection he suffered from the pyemic form of the disease.

This case justifies many valuable deductions. The infection unquestionably came from the bladder and the urethra. The primary injury led to chronic cystitis, ultimate stricture; the treatment, with its associated injury to the urethra, in all probability, added an infecting agent and death finally resulted from a grafting upon the endocardium of a pathogenic germ causing vegetating malignant endocarditis, simply an expression of general sepsis.

The high leucocytic count, with the physical examination and chills was also a strong argument in favor of malignant endocardial infection and against the diagnosis of typhoid. Such infections following urethral disease and operation on the genito-urinary tract are not as rare as most clinicians have imagined; during the past few years I have seen this complication in four cases, all of them positive but fatal.

Case II.—D. B., aged thirteen years, was seen on Nov. 6, of last year in consultation with Dr. Price. Family history: father died of brain tumor; mother and one brother living and well; no history of specific or hereditary taint in collateral branches. The boy had always enjoyed

splendid health, although he was never heavy; had grown very tall; had applied himself closely to his studies which probably accounted for his light weight. Dr. Price saw him first on Monday, Nov. 3, when he found the patient with moderate elevation of temperature after an initial and well-defined chill. Several weeks before he bruised the skin of his right heel, which for a few days gave him some discomfort. There was a small pustule over the middle of the right tendon Achilles, which had been dressed antiseptically by his mother and to which no great importance was attached. The doctor at his first visit thought the inguinal glands of the right side were slightly enlarged. From the time Dr. Price saw the case on Monday, until my visit Thursday evening, the symptoms were those of a true typhoid infection. Before my visit the Widal blood test was made with negative result. The temperature had ranged from 101° to 104° F. Pulse had been as high as 108; his respirations were somewhat accelerated. The blood count made on the previous day showed hemoglobin 95 per cent., red count 5,300,000, leucocytes 16,000. There had been no rose spots, no nose bleed, no diarrhea and so far as I know, no albuminuria. There was increasing delirium. The general appearance of the boy was that of a well-advanced typhoid. Apathy had preceded the delirium; the tongue was dry; the spleen was slightly enlarged; the area of cardiac dullness was but slightly changed; the impulse was feeble, 120 per minute at 10.30 P.M. There were in the mitral and aorta areas loud and distinct systolic blowing soft murmurs, the former transmitted to the left and posteriorly; the latter limited to the second interspace close to the sternum. A well-marked, hemorrhagic spot was noticed over the lower end of the right radius and a small linear petechia just above the umbilicus. He answered questions intelligently, when aroused, only to return to his delirium with at times active outbursts. A second Widal test gave as did the first only negative results. Enforced absence from the city during the next twenty-four hours prevented my seeing this patient again during his life. During the afternoon of Friday, he suddenly developed left hemiplegia and died Saturday morning in coma, with symptoms of brain pressure. During my absence Drs. Van Duyn and Price saw the patient and were scarcely able to hear the murmurs which during the preceding night were distinctly audible. The reasons for this material auscultatory change were clearly established by the history of the case after I saw the patient and the post mortem; to these I will refer again.

His history justified no other conclusion than that there had been associated with malignant endocarditis hemorrhagic infarct of the brain, involving the basal ganglia on the right side due to embolic detachment from the infected endocardium. The infection could only be traced to the insignificant injury to the heel. It may be assumed that the character of the mitral murmur was materially changed by the breaking away of

vegetations after I saw the patient, which finally led to the brain infarct. This accounts for the difficulty which Drs. Van Duyn and Price found in clearly distinguishing the murmur. Another factor which succeeded in masking the physical signs referable to the endocardium was an increasing pericardial effusion. Change in the character of murmurs with their disappearance at times, as in this case, coincident with evidences of embolic infarct is quite characteristic of malignant endocarditis. The facts which justified the diagnosis of malignant endocarditis at the time of my visit were the decided initial chill; the history of injury and presence of the pustule, the positive leucocytosis; the negative Widal reaction; the petechiæ and finally the physical examination, with grave symptoms of infection. Later we received the report of the presence in the blood cultures of the *Staphylococcus pyogenes albus*.

The post mortem, made by Dr. Steensland, may be thus abstracted. Reference will be made to only abnormalities found, though the obduction was made with unusual precision and care. There were 100 c.c. of bloody fluid in the left pleural cavity. Pericardial cavity contained about 75 c.c. of slightly turbid fluid, holding a few white flakes in suspension. The heart showed the proximal surfaces of the mitral valve along its free margin covered with wart-like vegetations, the largest about 7 mm. in diameter. In the center of the proximal surface of each segment of the aortic valve were similar vegetations. There were evidences of hemorrhagic infarct on the surface of the left lung. The spleen was soft; the brain, the pia and arachnoid were smooth and translucent; vessels at the base normal; tissue in the lower part of right Sylvian fissure soft. Section by Virchow's method showed the red softening extended into basal ganglia. These changes were due to infarction of the brain. Bacterial contamination of the blood during life showed on culture *Staphylococcus pyogenes albus*. The same germ was found in the pericardium and left lung.

This case proves the truth of the statement previously made that no primary focus is so slight that it may not ultimately give rise to grave and fatal endocardial infection.

The following case is one which must impress us with the great resemblance which malignant endocarditis bears to typhoid and the difficulty of differentiating these conditions by those who have failed to take advantage of many recently introduced refinements of diagnosis. In connection with these great difficulties the long duration (seven full months) of the final infection was striking, while the history shows the course of an acute endocardial infection grafted upon preceding chronic endocardial disease.

Case III.—On Sept. 9, 1901, I was called to see Henry S., aged fourteen years. Family history: father and mother living and well; one sister well; no hereditary taint. Patient was well until his fourth year, when he had some acute and transitory sickness and the attending physi-

cian discovered a marked mitral lesion. He grew, however, to be a strong boy; was never disturbed by his heart murmur or indisposition of any kind, until March 17, 1901, when he commenced to ail with all the symptoms of typhoid fever; a physician was called and diagnosed typhoid. During the first four weeks of his sickness, his fever continued high and with the physician three consultants, who saw him, never doubted the diagnosis of typhoid; indeed no other diagnosis suggested itself, so clear did the symptoms appear to the attendants. During the period of continuous fever, which, as I have reported, continued over four weeks, the temperature often mounted to 105° F. During this time there was repeated nose-bleed, distended abdomen, delirium and an eruption which was quite general was mistaken for the roseola of typhoid. Close questioning proved this to have been petechial and similar to that which reappeared frequently during the last two months of the disease.

The history, which I received from the doctor and mother (who was also the nurse and an intelligent observer), shows that after the fourth week, the patient was not continuously in a typhoid condition, but developed an intermittent fever, with temperature running as high as 105° F., followed by great exhaustion, profuse sweats, always preceded by severe chills. These chills and fever were coincident with either positive evidences of cutaneous infarcts or more grave deposits in internal organs including at various times kidney, lung and spleen. After Sept. 9, when I saw the patient first, there was never a time when either subjective or objective symptoms failed to show the presence of fresh and repeated infarcts. Petechiæ were particularly abundant about the fingers and palms of both hands, both the physician in attendance and the mother confessed that during the early days the eruption always showed itself here and on the abdomen, while bloody urine frequently showed fresh infarct into the kidney substance. There never was a time when the urine was without evidence of chronic tubal nephritis in albuminuria and abundant casts,—granular, hyaline and fatty. The urea was always abnormally low.

During the months preceding September, when the typhoid symptoms were at their height, neither a Widal test or blood examination were made. After I saw the patient, during the five or six weeks preceding the fatal termination of this case, repeated blood examinations always showed marked anemia; the red blood corpuscles never above 2,125,000; hemoglobin between 28 and 42 per cent.; there was persistent leucocytosis from 21,000 to 31,250; polymorphonuclear increase. No culture of the blood was made. There were at no time evidences of retinal hemorrhage. Physical examination of the heart showed left border increased one-half inch beyond the mammary line and about one finger's breadth to the right of the sternal edge. On auscultation, a loud systolic murmur was audible over the precordium, loudest in the mitral area, with a somewhat

softer systolic murmur in the aortic area transmitted upward toward the carotids.

The character of these murmurs never changed and they were always audible. The heart never beat slower than 120 per minute. The pulse was characteristic of mitral insufficiency. The aortic lesion never made its presence known by changing the pulse in any way. There were evidences in physical signs of hemorrhagic infarct from time to time in the lung and at times hemoptysis and edema of the lungs were coincident with the erratic chills and fever. Edema of the extremities, hydrothorax and puffiness of the face, were at all times present. The spleen was continuously enlarged. There was anorexia, muscular enfeeblement; mental hebetude alternating with hours of normal brain activity. Without marked change in physical signs, with repetition of irregular chills, petechial eruptions and the hemorrhagic infarcts, this boy, on Oct. 16, after severe convulsions, at first left-sided, involving arm and leg, also face, became hemiplegic and analgesic in these parts; Drs. Hawley and Larkin had charge of the patient at this time, owing to my absence from the city. He became comatose; his temperature reaching 106° F., the pulse became more and more irregular and erratic until he died on Oct. 17, exactly seven months from the inception of final infection.

The clinical diagnosis made ante mortem was primary chronic endocarditis, with mitral insufficiency, upon which an acute malignant endocarditis was grafted; chronic tubal nephritis, renal, pulmonary and splenic infarcts, with final cerebral infarct in the right internal capsule and surrounding brain tissue.

Post Mortem.—The important lesions may be epitomized as follows: Heart—There was marked hypertrophy of the left ventricle with some dilatation, the right half of the heart was also dilated and hypertrophied. There was about 30 c.c. of serum in the pericardium; about 200 c.c. of dark fluid in each pleural cavity. There were innumerable vegetations on the mitral and aortic valves; the free endocardium was covered in plaques with prominent vegetations. There were evidences of ulcerative changes here and there in the endocardium and in the valve tissue. The right heart contained but few vegetations; the pulmonary cusps were uneven and covered with vegetations—not many. Lungs—There were evidences of old infarct in both lungs,—considerable hypostatic congestion. Kidneys—There was an old infarct in the substance of the right kidney, white and well organized. In the left kidney there were several recent infarcts of considerable size, comparatively speaking. Besides there were the usual anatomic changes of chronic tubal nephritis with capsule adherent. The spleen was enlarged and adherent to abdominal parietes, omentum, and stomach. There were a number of remnants of old infarcts, white with age as in the kidney, fully organized, while in the center there was a more recent clot about the size of a dove's egg. The organ appeared

granular. The liver was pale, fatty, enlarged three fingers' breadth below the free border of the ribs. Brain—The dura mater was generally adherent; the surface veins were full and dilated. The sulci were closely adherent. The right internal capsule was soft, broken down, the seat of recent hemorrhagic infarct. In fact, the mid-brain showed evidences of having been recently flooded and its substance was accordingly changed in color and consistence. In the left optic thalamus there was a recent hemorrhagic deposit the size of an ordinary chestnut.

Dr. Stensland's report, made October 19, 1901, showed that there was but one pathogenic organism at work in this case, and that, the pneumococcus of Fraenkel. This he found present in cultures made from the heart vegetations, the spleen and both kidneys. Strange to relate the brain clot was sterile. Had this alone been examined and depended upon the bacterial contamination would have been overlooked.

The histories of these cases are grouped for the purpose of demonstrating the fact that infectious endocarditis with original typhoid symptoms may be either fulminating or they may drag out a long and chronic course. These cases are exceptional. The one because of its rapidity; the other its chronicity. Both at one time presented a pure typhoid picture. In both the leucocytosis and petechiae became prominent symptoms. In both there were hemorrhagic infarcts of vital organs. Both the acute and chronic cases terminated with almost the same cerebral symptoms, including hemiplegias, dependent upon large cerebral infarcts.

These cases are still further of great interest because they failed to show mixed infection. The acute case depended solely upon the streptococcus infection, while in the chronic the ravages were shown to be due to the *Micrococcus lanceolatus*, which we have learned to associate with pathologic processes distant from the organ which it selects by preference for its habitat, but in which it may cause no change while attacking vital organs, though the blood may teem with this specific germ life. In the acute case, there was no preceding endocarditis; if there had been it would have been detected by those who had previously examined the patient. The pneumococcus infection in the protracted case was grafted on valves, the seat of chronic change. Whenever I meet these cases, I am reminded of Goodhart's eloquent words: "Patients with chronic sclerotic valves are walking mushroom beds, in common times without spawn, but in periods of epidemics germs enter by various channels, which fertilize in these cases into ulcerative endocarditis; in others, to suppurative processes."

There were no pneumonic symptoms in the chronic case; never was there cough during the early days, nor sputum, save at times when toward the end of the disease there were both subjective and objective symptoms of pulmonary infarct. Endocarditis following or accompanying

pneumonia is rather rare. Of 254 cases of pneumonia observed in the Tübingen Clinic (Henke, *Virchow's Archiv*, Bd. clxiii, No. 1), but one was observed to have endocarditis. Weichselbaum claims that in 33 cases of endocarditis examined bacterially, seven were due to the pneumococcus. Osler states that 25 per cent. of his cases of malignant endocarditis are due to the pneumococcus; Harbitz reports five in 43 cases. An argument against the assumption that pneumonia preceded the endocarditis or was coexistent, is the fact that at the post mortem the usual features of a complicating pneumococcus endocarditis were absent.

Endocarditis of pneumonia has special anatomic peculiarities. The right side of the heart is attacked with an unusual degree of frequency and the aortic valve more frequently than the mitral. Infarcts are rare. In my case these were numerous, finally becoming the cause of death. Endocarditis complicating pneumonia is sudden in its onset and rapid in its course. Its prognosis is not always bad. These facts prove that the history of the case reported does not correspond in any particular with that of non-malignant complicating or coincident endocarditis. The post mortem satisfactorily explains the cause of the repeated chills and the final departure of the clinical history from the usual typhoid type of the disease to the pyemic or intermittent. With each fresh infarct, whatever its size or location, there was the characteristic chill, fever and sweat. Why the duration of the malignant forms of endocarditis due to the same infectious agents are so widely variable in different cases, no clinician can fathom. Thus the writer has seen cases of gonococcus endocarditis which have ended fatally in a few days with typhoid symptoms; others which have commenced with pyemic symptoms merging finally into the typhoid condition bearing the closest subjective resemblances to typhoid, ending in two to three weeks, and finally cases in which the clinical histories covered several months before death claimed the victim.

The following case is here reported because it shows the difficulties experienced in differentiating malignant endocarditis, typhoid fever and malignant purpura hemorrhagica:

Case IV.—G. S., aged forty years, was admitted to St. Joseph's Hospital, November 1, 1902. He is a steel worker. Family history: father died at the age of sixty-eight; mother is living and well; one brother died of pneumonia; one brother and sister living, both well. There is no history of tuberculosis, carcinoma, specific disease or hemophilia. The patient has used tobacco and alcohol in excess. The history of this patient shows that during the two months preceding the onset of acute symptoms, he had not been properly fed; had grown anemic and an existing shortness of breath had been considerably increased. Close questioning made clear the fact that he had suffered in the past from repeated attacks of inflammatory rheumatism, the

last of these in July, of the present year, when he was confined ten days.

The patient says that while at work on October 27 his nose bled for several minutes. During the following 48 hours he had a number of attacks of epistaxis, each hemorrhage more severe than any preceding. On October 29 the hemorrhage became alarming and he sought medical advice. Plugging of the nares by his attending physician failed to control the hemorrhage and at three o'clock on Saturday, November 1, he was admitted to the hospital with profuse bleeding from the left nostril. He was apathetic and ominously anemic. After he had been in the hospital a few hours, his temperature was 100° F., respiration 20 and pulse 84. During the night his apathy increased; his temperature almost touched 102° F. It was with the greatest difficulty that the epistaxis was controlled; in fact this hemorrhage was not finally controlled, in spite of repeated plugging of the nostril and the use of adrenalin, until November 8. During the time of profuse bleeding Dr. Halsted saw the patient; examined the nares with negative result. The doctor was impressed with the profound anemia, apathy and the profuse bleeding. He concluded that this patient must be suffering from some constitutional abnormality and, having failed to find nasal disturbance, on November 2 asked me to examine him with the object of determining the cause of the hemorrhage.

The subjective symptoms might have been taken for typhoid or some other grave infection. He was in a typhoid condition, profoundly anemic; abdomen was distended; mucous surfaces bleached; features pinched; his pulse was 112; respiration 24; temperature 101.8° F. He was disturbed by troublesome dreams and at times had more or less muttering delirium. His abdomen was covered with a large number of brown colored pigmented macules, between which could be seen a number of fine, small hemorrhagic spots; these purpuric spots were evenly distributed over the entire body. Physical examination revealed an increased area of cardiac dullness, reaching one inch to the left of the mammary line. The impulse was feeble.

There were mitral and aortic systolic murmurs. The mitral murmur was soft and blowing in character; the aortic systolic murmur was more distinct, coarser and transmitted upward to the right carotid.

On November 3 the patient's temperature reached 102.2° F.; respiration 24; pulse 100. The urine analysis on November 1, showed specific gravity 1.018, reaction acid; no albumin; no sugar. A second examination, on November 15, showed specific gravity 1.020; reaction acid; albumin. Microscopic examination showed urates, bacteria, pus but no casts. On November 5, the blood count showed 1,100,000 red corpuscles in each cm.; leucocytes, 9,100; hemoglobin, 20 per cent. With the profound anemia therefore there was a relative increase of leucocytes which was quite suggestive, when taken in connection with

the symptoms of infection. Blood cultures made by Doctor Steensland on November 3 and 8 proved to be sterile.

On November 15, one week after the hemorrhage was finally controlled, there were no fresh purpuric spots, the blood count showed 2,122,000 reds; 7,000 whites, in each cm. of the blood, and hemoglobin 32 per cent. From November 1 to 8 this patient was desperately ill.

The interesting features in this case, are the hemorrhages, the petechiæ, the early febrile movement; the marked anemia, in positive physical signs with the typhoid condition. The differential diagnosis needed to be made between malignant endocarditis, atypical typhoid and malignant purpura. We were positive of the fact that the patient had endocarditis. The question which was of transcendent importance was whether we were dealing with a fresh malignant endocarditis, a malignant endocarditis grafted upon a chronic lesion of the endocardium, or whether there was an unchanged chronic endocarditis which bore no relation whatever to the acute disease from which this patient was suffering. Against the assumption that we were dealing with malignant endocarditis was the preceding anemia without fever, the history of malnutrition; the profuse hemorrhage, the remnants of old cutaneous hemorrhage and recent ecchymoses, the absence of bacterial contamination of the blood as proved by culture experiments; the enormous and sudden increase of anemia; with a history of preceding rheumatism, which might account for the changes in the endocardium of a chronic character.

Clinical experience, including (comparatively speaking) a considerable number of cases of malignant endocarditis, has convinced me that such profuse hemorrhage is unusual in this disease. The negative Widal test, the sterile blood cultures; the enormous hemorrhage from the nose, the petechiæ, covering almost the entire body; the absence of rose-spots; the enormous relative leucocytosis with the anemia, and the absence of splenic enlargement, argued against the assumption that the patient was suffering from typhoid fever.

The subsequent history of the case has proved conclusively that we were dealing with a malignant type of purpura hemorrhagica in a patient who had a non-malignant endocarditis which followed repeated attacks of rheumatism. The patient has recovered fully from the purpura hemorrhagica; the physical signs remain practically unchanged, though the aortic murmur is less distinct than it was during the period of greatest anemia, the mitral systolic murmur remains as before. The blood count, made December 8, showed red corpuscles, 4,100,000; white corpuscles, 9,900; hemoglobin, 62 per cent.

A similar case reported by the writer in his article on malignant endocarditis, which appeared in the *Jacobi Festschrift*, in which a girl of fifteen years of age, who had been sick between two and three weeks, had a continuous fever

without intermission, was supposed to be suffering from typhoid. About the tenth day of the disease she had profuse intestinal hemorrhage, more or less distention of the abdomen, slight enlargement of the spleen, a very rapid pulse, grave anemia with great prostration. She had a copious intestinal hemorrhage the evening I saw her. The heart was rapid; the sounds muffled and indistinct. The suspicion of endocarditis was at once considered. It was found that there was a far-reaching purpuric eruption. The spots varied in size from a pin-point to a split pea. The mind was clear, the pupils dilated, there was no evidence of retinal hemorrhage.

Typhoid fever, malignant purpura and malignant endocarditis were considered. Widal reaction was negative. The blood count showed the red corpuscles reduced one-half; the whites relatively decreased, diazo-reaction negative. In the course of a few days there were hemorrhages from the buccal mucosa. The mind remained clear; the pulse was persistently rapid; the heart sounds less muffled than before without adventitious sounds. The diagnosis of typhoid fever was eliminated, but to differentiate malignant endocarditis and malignant purpura required two weeks. The patient made a tardy recovery with a normal heart after a long convalescence, which fact convinced us that she had malignant typhoid purpura, which Hoffman has described so fully and well.

The marked anemia early and the secondary anemia after hemorrhage, became important factors in diagnosis. In some cases of malignant endocarditis, especially those covering considerable time, the anemia is much less marked than in malignant purpura, with typhoid symptoms. There may be four million erythrocytes. In the markedly septic cases with typhoid symptoms the anemia becomes severe, not often so great as in the case of malignant purpura reported, while in the typhoid and septic form of malignant endocarditis, the red cells are often degenerated; a condition which is easily recognized even in dry specimens. The careful and repeated study of the blood became an important factor in the very difficult differentiation of the case just reported.

Our minds have been actively stimulated of late to consider clinical pictures, which we have learned to group under the head of paratyphoid infections. Recent events have given to the Widal test greater importance than ever before. Under the head of paratyphoid, Brill and Meltzer described the acute infections where all the signs and symptoms of typhoid were present but with negative Widal. In this country Gwyn reported the first case. In Germany many acute observers have decided that the intermediate group of bacilli cause pathological changes, not necessarily fatal, but resembling typhoid so closely that they are differentiated with the greatest difficulty. Such cases we have seen in hospital and private practice; they offer a clue to many fevers which were formerly grouped under the head of "Continued Fever," for now by the

aid of bacteriological examination of these cases, the absence of the Widal test, we are enabled to give such infections their positive significance.

It would be foreign to my subject to consider with you the morphological and cultural peculiarities of paratyphoid bacilli. They resemble typhoid more than the colon bacillus, as they do not ferment milk. They differ from the typhoid bacillus by their ability to ferment glucose and to produce alkali in the culture media. This question has received considerable attention at our hands, and in the near future I shall have the data, founded upon scientific bacteriological examination, to give you. At this time I can only say that because of the fact that these paracolon infections are associated with typhoid symptoms, the resemblances between them and malignant endocarditis are striking and offer to the unsuspecting many obstacles to positive early differentiation.

The typhoid types of malignant endocarditis are particularly likely to be mistaken for paratyphoid or paracolon infection. Indeed, repeated blood examinations, with negative Widal tests; the differential count of leucocytes and the daily search for petechiae and hemorrhagic infarct must finally lead to correct diagnosis. One case which I have interpreted as belonging to this group might readily have been mistaken for malignant endocarditis had I not known of previously existing endocarditis. There were all the symptoms of typhoid, continued fever, a mitral systolic murmur, negative Widal tests; absence of leucocytosis with negative diazo reaction. Recovery followed after six weeks of unquestioned paratyphoid infection.

The writer has been frequently asked whether cases of malignant endocarditis ever offer a favorable prognosis. When patients have recovered, I have concluded that the diagnosis of non-malignant endocarditis only was justified. It is safe to conclude that malignant endocarditis is almost always fatal. I understand very well that Herrick and others have reported a series of recoveries. Some of these cases have been treated with the soluble silver salts. I wish my clinical experience might lead me to other conclusions than those which I have reached. Only once in my experience have I seen a patient recover in whom I had diagnosed malignant endocarditis, whose blood was positively found to be bacterially contaminated with gonococci. This was in the case of a young man twenty-five years of age. Dr. Kieffer made blood cultures with positive results. The case merged from the typhoid type into the pyemic and after two months made a full recovery without serious permanent damage to the valves, though there were positive evidences in murmurs, of far-reaching change.

In connection with this subject one fact must exert a controlling influence in diagnosis: It is the positive rarity of endocarditis as a complication of typhoid fever. If the pathological records of large hospitals and private practice are studied, this truth will be received without hesi-

tation. Considered collectively, typhoid shows a surprisingly infinitesimal number of permanent heart lesions during the acute febrile period, or following. Hence with evidences of endocarditis and the typhoid condition, we are justified in assuming that the disease is not typhoid fever.

This knowledge must serve as a fundamental principle in the recognition of the disease under consideration. In the presence of murmurs with infection, the presence of petechiae, disturbed circulation, infarcts and leucocytosis, negative Widal, we may strongly suspect malignant endocarditis. *To make the diagnosis positive ante mortem, we must have the presence of physical signs referable to the heart, and these we have in the majority of our cases before death.* Do not forget, however, that the endocardium may be plastered with vegetations without giving rise to physical signs. The presence of embolic infarct is a valuable diagnostic fact; it means much.

In another article I made the following statement, which I repeat with renewed confidence. "It matters not how few evidences of embolic infarct we have, *if we have any*, and these are associated with limited cardiac changes and the presence of few general symptoms, we must suspect the possibility of malignant endocarditis. The importance of these embolic processes, each a source of infection and producer of symptoms was demonstrated years ago by Virchow in his original study of embolism and pathological researches have since accentuated their importance."

The aid which I have received from the recognition of hemorrhagic infarcts, including retinal hemorrhages, in various cases would give material for another paper. Watch carefully and you will find evidences of embolic infarct in almost all cases. Transitory, or even lasting paralyses in the midst of acute general infections are exceptional, save in those processes associated with embolic detachment and consecutive tissue change. In malignant endocarditis these are frequent. Certain it is that these do not complicate typhoid, or appear at the height of the febrile period. Detachment of vegetations and other factors in malignant endocarditis are prone to cause changes in physical signs, hence the mutability of murmurs and changes in their character. The right heart in these cases is involved out of all proportion to the left-sided disease in less malignant or other forms of secondary endocarditis. Let us bear this in mind, for it will frequently add a link of positive value. Obstructive murmurs are frequently materially modified. Chronicity is no argument against the diagnosis of malignant endocarditis. Case III proves the truth of this statement.

In considering the cases reported it must not be forgotten that the change from one type of the disease to another is quite usual. The typhoid type may either precede or follow conditions which give the infection for a time distinctive features.

Symptoms of typhoid fever continuing during several weeks *without chills*, with more or less

looseness of the bowels, enlargement of the spleen, increasing anemia, slight albuminuria, mental torpor, no paralyses and no marked physical symptoms referable to the heart become puzzling. Such cases we have noted. The negative Widal test, the leucocytic count, the final evidences of heart involvement and in most cases late erratic chills will be sufficient to clear the diagnosis. The diagnosis of typhoid fever must be surrendered if the patient has repeated chills. You may safely exclude typhoid, if with a chill there is leucocytosis and symptoms of infection. *If the disease were primarily typhoid we may be sure of secondary infection if chills persist.*

Chills, in the course of acute disease, are always suggestive and demand an examination of the heart and parts of the body which are often the seat of embolic infarct or pus deposit. In Central New York the cases of typhoid fever with well marked chills are exceedingly rare. The association of typhoid and malignant endocarditis has been so rarely found that chills in the course of typhoid are not suggestive of this complication. Malignant endocarditis has less morning remission of the temperature than has typhoid fever. The pulse is more rapid, softer, has less character and is more likely to intermit and become irregular and arrhythmic. There is as a rule no appreciable prodromal period in malignant endocarditis. Myocardial changes with associated symptoms have been demonstrated in the majority of cases of acute ulcerative endocarditis.

Finally, I wish to say a few words concerning blood examination. Leucocytosis with polymorphonuclear increase must always remain a strong link in the chain of evidence. The statement which I am about to make may appear dogmatic, but it cannot be justly controverted. *It is the duty of the physician in all cases of infection to make examinations of the blood sufficient to give him a clear idea of its condition.* It is as important as is the examination of the heart and lungs and if systematically followed, will give evidences upon which may be founded many positive conclusions. *We do not depend on the blood count alone.* Experience teaches us to interpret without overestimating its value.

The specific germ found in the blood by culture experiment must of necessity give decided evidence in many cases of the port of entry of the germ causing secondary infection. Repeated negative results of cultures of the blood make the presence of malignant endocarditis unlikely. A positive result with associated subjective and objective symptoms often makes diagnosis positive. It must be remembered that while leucocytosis is present in all cases of malignant endocarditis it may be intermittent and a single observation may fail to disclose it. Cases which run a rapid course, ending fatally in a few days or weeks, are the more likely to give positive evidence on culture experiments than are those cases which are chronic.

It would be a mistake then to hold that repeated negative cultures are sufficient to exclude

ulcerative endocarditis. Kuhnau has said: "The difference between simple ulcerative and malignant endocarditis is one of degree, not of kind and in many cases of subacute or malignant ulcerative endocarditis of bacterial origin, the blood is sterile." Many may claim that blood examinations require too much time. This is not a valid objection. There are many young men and women in this and other cities and throughout the country districts, who have been thoroughly trained in laboratory methods, who are not only ready but eager to do this work for us. Why should the busy clinician hesitate to employ these helpmates, when by such examinations diagnosis is made more exact and satisfactory and the struggling scientist is encouraged as he deserves to be?

It was a source of great satisfaction while writing this paper to meet one of our own number, grown gray in service, engaged in this work at the bedside with his microscope examining case after case himself, as thoroughly conversant with the newer methods of diagnosis as the most recent graduate. *Such application of exact science to our art becomes an important factor in medical practice.*

As experience grows, as we apply rational methods, including the aid received from a thorough study of the blood and bacteriological investigation, the deliberate consideration of physical signs and subjective symptoms, malignant endocarditis becomes a condition which will in the large majority of cases not only be suspected but positively diagnosticated.

NEPHRORRHAPHY IN INTERMITTENT HYDRONEPHROSIS.*

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It is a pleasure indeed to be invited to meet with this Society to-day, and my sense of gratitude is not unmingled with a feeling of inability to present to you the subject of the relation of movable kidney to intermittent hydronephrosis. I trust my humble effort will meet with your sympathy. Hydronephrosis is a term applied to overdistention of the kidney by retention of urine from any cause. Martineau, in 1785, called it "hydropsrenis;" and Johnson, in 1816, "hydronephrosis;" Rayer, in 1841, used the term "hydronephrosis," which ever since has been the accepted term. It is to be distinguished from renal cysts by the fact that the latter have no connection with the pelvis of the kidney but are formed within the structure of that organ, while hydronephrosis practically always involves the pelvis of the kidney and usually more or less of

* A paper read by invitation at a meeting of the Tri-State Medical Association of Western Maryland, Western Pennsylvania and West Virginia, at Cumberland, Md., December 11, 1902.

the ureter. This condition may involve one or both kidneys.

Causes of Hydronephrosis.—Hydronephrosis may be either congenital or acquired and no matter what variety it may be the obstruction is never both permanent and complete, as experiments have shown that atrophy of the kidney inevitably follows prolonged suspension or loss of function of that organ. Moreover, repeatedly has a ureter been accidentally ligated during a surgical operation and no trouble followed. Again the ureter has been accidentally severed under like conditions and the proximal end purposely ligated, a slight swelling in the region of the kidney occurring later and soon permanently disappeared. The obstruction may be complete for a short time or partial for an almost indefinite period. In the congenital variety malformation in the ureter, kidney or renal artery is frequently present. The ureter may be imperforate or enter too obliquely into the pelvis of the kidney or the artery or a supernumerary one may cross and compress the ureter. This duct has been found twisted upon its own axis in some cases. Congenital diverticula of the kidney have sometimes been found the cause of hydronephrosis and even pyonephrosis. The vesical orifice of the ureter has been found inelastic preventing free flow of urine. Urethral and bladder abnormalities may produce congenital hydronephrosis and in such cases it is usually double. One case was reported in which a tightly constricted preputial opening was the only assignable cause. These are only a few of the large number of causes of congenital hydronephrosis. It must be remembered that congenital causes may not produce hydronephrosis for a long time, even years after birth.

The causes of the acquired variety embrace also a large number of conditions. If the urethra or anterior portion of the bladder be the seat of it the effect will be noticed on both sides. When the obstruction is along a ureter the corresponding side alone will be involved. Such obstruction may be in any portion of it, but is most apt to be at one of the three principal points of constriction, viz., at the outlet of the pelvis, at the point where it crosses the common iliac artery and at a point about one inch from the bladder. These are places of normal marked narrowing of the canal of the ureter. There may be a kink in the ureter or a calculus lodged in the duct. A tuberculous, carcinomatous or other form of growth may press upon the duct, either continuously or intermittently. A large number of other conditions have been found to cause it, but the conditions we are to particularly consider are of the intermittent type. This form of the condition is due to a cause acting with intermissions and is usually along the course of the ureter. It may be due to the pressure of a solid tumor of some movable organ such as an ovary or the uterus, or a floating spleen, or the relaxation of the peritoneum such as is met with in floating kidney and which permits temporary flexions in the ureter; the presence of a calculus that occasionally blocks the ureter and

then permits urine to escape by it may have a similar effect. Valve-like constriction of the ureter acts similarly. In fact these constrictions are now recognized as a quite common condition and surgical relief of it has furnished one of the cleverest chapters in surgery. Witness the brilliant success in the first case of operation for relief of valve-like constriction of the ureter by Kuster, resulting from hydronephrosis in an only kidney in a young man. But by far the most frequent cause of hydronephrosis is movable kidney.

According to Henry Morris, abnormal mobility of the kidney was a subject of a chapter by Mesue of Venice more than four hundred years ago (see Editions 1497, pp. 187 and 1561). Francis Pedemontanus in 1587 and 1623 (p. 75), and Riolan in 1682 wrote on this subject, but it became of deep interest to the profession only after Martin, of Berlin, in 1878, did the first nephrorrhaphy for this condition, and Hahn (who died last month), of the same city, in 1881 published his first operation for fixing a movable kidney. Since that time this condition has held the careful attention of the surgical world. Probably Edebohls, of New York, has done more than any other to make the various relations of this condition understood, to formulate the plans for its treatment and the indications for each and to demonstrate the excellent results of such treatment. Mobility of the kidney to a limited degree is essentially physiological. Its elastic attachments to firm adjacent structures permit its upward and downward movement with the diaphragm and its slight depression from force of gravity with the individual in an upright position. In the average person this mobility varies little from one inch, the extent being different in different individuals. The lessened depth of and greater width of the inferior part of the renal fossa in women are reasons assigned by Deletzne and Volkoff (*Med. Mod.*, March 10, 1897), for the greater mobility in this sex. The extent of downward movement of the movable kidney is limited only by the cul-de-sac of Douglas.

Just here it is well to refer to the supporting structures of the ureter that we may clearly understand the causal relation borne to intermittent hydronephrosis by a movable kidney. The ureter in its course from the kidney to the bottom of the pelvic basin is supported by the connective tissue in the wall of the peritoneum. As far back as in 1856 Gigon noted that the ureter was at the time markedly bent when the kidney was displaced downward in considerable degrees of mobility and he suggested it might be a frequent cause of complete obstruction to the urinary current. This suggestion has become a fact frequently demonstrated. In truth such kinking of the ureter is frequently observed. It is easily understood that this duct will resist depression with the kidney and will only yield as the kidney is depressed and pulls downward that portion of the ureter above it. This naturally causes a sharp curving or an angulation of the duct which obstructs the passage of the urine by that point, which obstruction is

only relieved by the kidney returning in some way toward or to its normal position. When this occurs the accumulation of urine above the point of obstruction passes rapidly to the bladder.

Symptomatology.—The symptoms of intermittent hydronephrosis are usually preceded by those of movable kidney which are usually indefinite and indeed may be due to slight distention of the portion of the ureter above the obstruction and of the kidney. But the symptoms of a well marked case of intermittent hydronephrosis are intermittent attacks of localized tenderness in the region of the kidney, changing to severe pain, the degree of which depends largely upon the degree of distention or partly upon the length of time the condition has existed. A scanty amount of urine is voided during the attack. This may be due partly to a reflex action upon the other normal kidney, partly or entirely suspending its function, but principally, I believe, to the stoppage in the affected side. Usually during the attack a soft tumor may be felt in the region of the kidney. Suddenly the patient experiences a sense of relief from suffering and shortly begins to void urine with the result of passing large quantities for a few hours. With this passage of so much urine the tumor disappears and the tenderness lessens and may completely disappear before the occurrence of another attack. The urine in hydronephrosis is lacking in solids, odor and acidity.

Diagnosis.—The diagnosis of intermittent hydronephrosis is based upon a history of previous attacks of a similar character, the localized pain and swelling, the small amount of urine voided during the attack and large amount passed during the disappearance of the pain and the marked difference in character of the two specimens. The presence and disappearance of the tumor in conjunction with the above symptoms is of great value in diagnosis, as is the discovery of a movable kidney upon a subsequent examination. As most cases of intermittent hydronephrosis are due to movable kidney this is presumably the cause of the attack but search for other contributing causes should not be neglected and if not found treatment of the movable kidney should be instituted.

Treatment.—For this nothing can be more rational than the employment of some means to prevent renal displacement. Various bandages with repeated modifications have been used for this purpose with little success. Nephrorrhaphy is the remedy *par excellence*. In a number of cases I have been surprised by the absolutely permanent relief of the suffering from this condition in which nephrorrhaphy has been done. The following cases will serve as examples:

Case I.—Mrs. F., forty-six years of age, white, widow; was referred to me by Dr. C. R. Collins, for severe pain in the right side. She was at the time and had been for two years past an inmate of the Home for Incurables. At various intervals during the past nine years she had suffered with attacks of intense pain in the right side of the

abdomen, lasting for a number of hours and during which Dr. Collins had at various times found one to two grains of morphine given hypodermically was insufficient for relief and chloroform anesthesia was required. Her last attack was four months before my seeing her November 23, 1897. An examination revealed the right kidney hovering over the brim of the pelvis. Two days later the kidney was delivered through a loin incision carefully palpated and its capsule split along the convex surface and sutured to the muscles of the back. The kidney was found to be normal in size and consistency and the upper few inches of the ureter slightly larger than normal. The patient has had no more attacks.

Case II.—Mrs. C., white, twenty-one years of age, married and had one child three years ago, after normal labor. She was sent to Columbia Hospital March 25, 1897, suffering with severe pain in the region of the right kidney. For three years she had suffered at frequent intervals with like attacks. An examination showed a large, soft pyramidal shaped mass slightly above and to the right of the umbilicus. The presence of the kidney in its normal position could not be made out. Intermittent hydronephrosis was diagnosed and gentle pressure of the mass upward gave the patient a sense of relief. A bandage was applied over compresses to continue this pressure with the result of completely relieving the pain and disappearance of the tumor with voiding of a large quantity of urine. On the following day the kidney was found movable over an extent of nearly four inches. March 29 nephrorrhaphy was done, and up to last spring, which was the date of my latest information she had had no subsequent attacks.

The operation is by no means severe, taxes the patient's vitality but slightly, and promises almost certain relief by preventing a recurrence of the angulation of the ureter. By fixing the kidney in its normal position the ureter is straightened and the temporary angulation of it, which has caused the intermittent obstruction, is removed. The principle underlying the indication for nephrorrhaphy is a simple one in physics and if the operation be correctly done gives promise of permanent relief.

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EXTRAPERITONEAL LIGATION OF EXTERNAL ILIAC FOR FEMORAL ANEURISM.

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JOHN D., thirty-eight years of age; colored; barber. Family history negative. Previous personal history syphilitic. Habits—alcoholic. His present illness began Nov. 28, 1902. He fell and struck the left thigh on the upright end of a heavy piece of timber. He suffered only a small amount of pain at the time. Two days after the injury the thigh began to swell, and pain, which had been intermittent, returned. Relief

was obtained by the recumbent position. He remained at home for three days unattended. At the end of this time the swelling decided him to call a physician, who made a small incision, the diagnosis of abscess being made. Fortunately only a "medical incision" was made resulting in the abstraction of a small amount of blood. This was controlled by tight bandages and the patient was advised to go to the hospital.

I examined the patient three days later, eight days after the injury. At that time I found a powerfully built man, 168 pounds in weight, with healthy heart, lungs and kidneys. The arteries throughout his body were considerably thickened and palpable. The left upper thigh was the seat of a pulsating tumor, extending from Poupart's ligament to the junction of the upper and middle third of the thigh, $5\frac{1}{2}$ inches in length, three inches wide and two inches in height. The usual physical signs of aneurism were present and the leg and foot were considerably swollen. On the inner side of the tumor surface the incised wound still oozed. There existed a dull, boring, and continuous pain. On account of the general condition of the vessels and time of duration, it was the writer's opinion that the entire limb would have to be sacrificed, nevertheless it was decided to attempt ligation and wait for a week or ten days for developments.

His temperature at this time was 98.6° F.; pulse 68; respiration 20. Urine Sp. Gr. 1.020; acetone, albumin and sugar negative. Ether, time 20 minutes.

An incision $3\frac{1}{2}$ inches long (parallel to Poupart's ligament and corresponding to the McBurney's for appendicitis) was made through the skin to the external oblique. Intermuscular separation to the peritoneum was practised. The peritoneum itself was then easily separated, going outside until the vessel was palpated, which vessel was found to be shoved up and to the outside of the usual site. The peritoneum was then retracted, exposing the vessels. In passing in the ligature carrier the wall of a vein was wounded and the wound immediately filled with blood. This hemorrhage, however, was controlled by pressure of the finger, replaced by hot-gauze packing for five minutes. At the end of that time, as there was no oozing, the packing was removed and a silk ligature was tied. This caused an immediate stopping of the pulsation in the tumor. The wound was then washed out with salt solution, the parts restored to their original position, the separated muscles closed with catgut No. 2, the skin with interrupted and continuous silk sutures, the wound dressed with sterile gauze and cotton, and the entire limb swathed in cotton and bandaged. The pulse during the operation averaged 80.

The after-treatment consisted in elevation of the leg and continuous heat combined with Tuffnell's treatment. No pain or discomfort followed the operation.

Primary union took place in the wound. Pulsation was felt in posterior tibia artery on the

third day. The foot and leg remained cold for five days and for twelve days after were colder than the leg of opposite side.

The heat and elevation were continued constantly for 17 days. Three weeks after operation the tumor had decreased to one-half of its original size and no pulsations could be felt. The patient was discharged from the hospital with instructions to keep in bed on arrival at his home and to continue potassium iodide. He at this time was getting 120 grs. per day. Patient remained in bed for two weeks at home, at the end of which time an examination revealed a small tumor, one-third of original size, and with no pulsations. The circulation in the foot was good. Since this time I have seen the patient on an average of twice per month and he has had no further trouble from the old condition and is now at work.

I wish to call particular attention to the slight trauma necessary and the rapidity of the formation occurring in one already suffering from endarteritis.

INTUSSUSCEPTION: REPORT OF A CASE REDUCED BY OPERATION.*

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PROFESSOR OF SURGERY IN GEORGETOWN UNIVERSITY.

In his study of 1,000 operations for acute intestinal obstruction, Gibson found that intussusception caused the obstruction in 187 cases, thus holding the second place in point of frequency in the etiology of this condition, hernia coming first with 354 cases.

Varieties.—Four varieties of intussusception are given, in order of frequency as follows: (1) *Ileocecal*, in which the ileum with the cecum slips into the colon, the ileum continuing to push the ileocecal valve in front of it, and to invaginate the colon; (2) *enteric*, in which the small intestine telescopes itself; (3) *colic or colicorectal*, in which the colon telescopes itself or the rectum; (4) *ileocolic*, in which the ileum slips through the ileocecal valve, the cecum and colon maintaining their normal position. According to Wiggin, 80 per cent. belong to the ileocecal variety. According to the degree of obstruction or strangulation of the bowel, intussusception may be acute or chronic. The *acute* form may, like strangulated hernia, produce death in 24 hours or the patient may survive two or three weeks, while the *chronic* form may last indefinitely with symptoms of stricture rather than strangulation of the bowel.

Etiology.—It is estimated that more than half the cases occur in children under ten years of age, and more than one-third of all cases occur in infants under one year of age. Wiggin found it three times as frequent in males as in females. Whatever produces violent and irregular peristalsis, as indigestion or traumatism, may cause

* Read before the Medical Society of the District of Columbia, Jan. 27, 1902.

the condition. The circular muscular fibers contract and diminish the size of a segment of bowel while the longitudinal fibers contract and pull the segment of larger caliber up over the contracted portion and thus the telescoping begins. The inside tube, doubled on itself with its peritoneal layers approximated, constitutes the *intussusceptum*, while the outside tube of a single layer is the *intussusciens* or receiving part and has its mucous coat in contact with the outside mucous coat of the *intussusceptum*. The *intussusceptum* varies in length from an inch or two to two or three yards and the apex of the *intussusceptum* may be felt in the rectum or it may protrude through the anus. Traction and compression of the blood vessels in the mesentery soon disturb the circulation and lead to inflammation and perhaps gangrene, sometimes with sloughing of the entire *intussusceptum* and a spontaneous cure. Occasionally the invagination is *compound*, the entire intussusception telescoping the bowel below, taking on two more coats and giving it five layers, and it is said that even a third invagination of the same portion may occur, giving the intussusception seven layers.

Diagnosis.—The diagnosis is made by the age of the patient, the sudden occurrence of colicky pain, followed by vomiting, constipation, and if the colon or rectum be involved, by the passage of blood and mucus, accompanied with tenesmus. A tumor can be detected in more than half the cases, either in the rectum or it may be felt through the abdominal walls of an elongated, cylindrical or sausage-shape, more frequently on the right side. Hernia, volvulus, fecal impaction and intestinal obstruction from other causes must be excluded.

Treatment.—The rational, sensible and life-saving method of treatment is laparotomy as early as possible within the first 24 hours. The same necessity for prompt operation exists as in strangulated hernia. Hydrostatic pressure with the child inverted may be tried during the first few, say 12, hours, but the method failed in three-fourths of the cases reported by Wiggin; besides there is danger of rupture of the intestine if too great force is used, and the beneficent results of a timely laparotomy should not be jeopardized by too long delay in the practice of uncertain and exhausting methods. Without operation the mortality is from 60 per cent. to 90 per cent.; with operation, according to Wiggin, only 32 per cent., and I am satisfied that if all cases were operated on within the first 12 hours, the mortality would be less than 5 per cent. The importance of early operation is well shown in Gibson's list of 187 operations for intussusception in which the mortality was 37 per cent., when performed on the first day, 39 per cent. on the second day, 61 per cent. on the third day, 67 per cent. on the fourth day, 73 per cent. on the fifth day, and 75 per cent. on the sixth day.

In the same way the difficulty of reducing the invagination increases with the lapse of time, 94 per cent. being reducible on the first day, 83 per

cent. on the second day, 61 per cent. on the third day, and 40 per cent. on the fourth day. The abdomen should be opened over the tumor, usually through the right rectus muscle and the intussusception reduced by gentle traction on the *intussusciens*. Should this be impossible, and the parts of good vitality, they may be reduced after exposing the *intussusceptum* by a slit in the *intussusciens* or the *intussusceptum* may be amputated after clamping it with forceps. The two coats are then sewed together and the incision in the *intussusciens* closed; or the invagination may be side-tracked by a lateral anastomosis between the intestine above and below; or it may be literally cut out of the circuit, its two ends closed with sutures and left in the abdomen, while the circuit is restored by anastomosis between the remaining two ends of the intestine. If gangrenous, the entire mass should be removed and an anastomosis or artificial anus formed, preferably the former. In gangrenous cases the mortality is very high with any method of treatment—about 80 per cent. in Gibson's 56 cases, but without operation it must be remembered that such cases are doomed to inevitable death.

Case.—C. R., white, male, aged five years; was taken ill June 19, 1902, with cramps in the bowels thought to be the result of eating pineapples. There were vomiting and bloody stools, but no tenesmus. I first saw the patient with Dr. A. Behrend June 25, six days after the attack began. At that time he was lying on his back with knees drawn up, inclined to sleep (probably the effects of the laudanum he had taken), and very irritable on being aroused. Examination of the abdomen failed to detect a tumor but it seemed to be more sensitive on the right side. The temperature and pulse were slightly above the normal. Intussusception, appendicitis, and colitis were considered, and in the absence of a tumor or constipation and in the presence of bloody stools, I was inclined to the diagnosis of colitis and advised against operation unless something more definite should develop. Three days later, June 28, I was again called in by Dr. Behrend, the patient having grown worse. Examination of the abdomen now revealed an elastic, oblong tumor to the right of the navel, also tenderness and some rigidity of the right rectus muscle. Nothing could be detected by rectal exploration. Invagination was diagnosed and immediate operation advised, but some doubt was still felt, owing to the perviousness of the alimentary canal as shown by the use of bismuth.

The patient was removed to Georgetown University Hospital and operated on at 8:30 P.M. On opening the abdomen through the right rectus muscle over the tumor and turning the great omentum to the left, the tumor was seen to consist of the dark-colored distended ascending and part of the transverse colon, within which the cecum, appendix, and part of the ileum had disappeared. Firm traction on the ileum (the *intussusceptum*) failed to reduce the invagination, but this was accomplished with great facility by trac-

tion on the colon (the intussusciptions). The intussusception belonged to the ileocecal variety, was about three inches long and contained six to eight inches of intestine. There were no adhesions. The abdomen was closed without drainage, with through and through silkworm-gut sutures and catgut for the peritoneum and sheath of the rectus. Recovery was uncomplicated. The stitches were removed July 9, the eleventh day, and the patient discharged recovered July 13.

MEDICAL PROGRESS.

MEDICINE.

The Distribution of Albumin in Animal and Human Body Fluids.—The partly diagnostic, partly prognostic value of the investigation of normal and pathological body-fluids with respect to their albuminous content, has, according to J. JOACHIM (Pflüger's Archiv f. Physiol., Vol. 93, Nos. 11-12), been realized as early as the fifth decade of the last century. While the first workers in this domain were concerned solely with the quantitative determination of the total albumin, the recent investigators have profited by the advanced methods and have drawn important diagnostic data from the so-called "albumin-quotient," i.e., the relation of albumin to globulin. The author investigated transudates and exudates, human and animal blood sera, albuminous urines, the fluids of an ovarian cyst and a hydrocele and the fluid of a subcutaneous edema. In the cases of transudates and exudates of the pleural cavity, there was in the former a greater constancy with respect to the proportions of albumin, euglobulin and pseudoglobulin, than in the latter. The relative proportion of euglobulin in hydrothorax is always lower than that in pleurisy. In examining the fluid of peritoneal ascites, the author found that in cirrhosis there is the highest relative globulin-content, the lowest albumin-content, and in carcinoma there is the lowest globulin-content and the highest albumin-content. The figures for ascites of cardiac origin stand midway between those for cirrhosis and carcinoma. In abdominal ascites caused by carcinoma of the liver, gall-bladder, ovary, stomach or intestine, there is the highest relative albumin-content and the lowest euglobulin-content. These changes are not to be ascribed to the cachexia secondary to carcinoma, for among the author's cases there were many in whom, at the time of puncture, the nutrition was good and the subcutaneous fat abundant. In tuberculous peritonitis there is no law governing the distribution of the albumin, for in all the proteid groups there are extraordinary variations. If transudates and exudates (and sometimes albuminous urine) be weakly acidulated with acetic acid, there is precipitated an albuminous body, which, identical with that constituent of para-euglobulin which is precipitated by acetic acid, is probably to be found more abundant in exudates than in transudates. By strong acidulation there is precipitated from exudates and certain urines (including those free from globulin or albumin) an albuminous body which very probably is a nucleo-albumin or a nucleoproteid. The recent researches of v. Limbeck and Pick on the blood of a large number of patients showed wide variations in the proportions of albumin and globulin, so that the figures obtained were of no diagnostic importance. With respect to albuminous urines, the author found pseudoglobulin in every case, euglobulin was absent in three cases, and in three others present only in very small quantities, and only in a case of amyloid degeneration

approached pseudoglobulin in bulk. The albuminous-content mostly exceeds that of the globulin.

Hereditary Syphilis.—The ravages of this disease, which are so frequently seen upon the faces and bodies of so many children and adults, speak more forcibly than words and are only too conclusive as evidence that almost criminal mistakes in diagnosis are frequently being made by physicians. E. H. GRIFFIN (N. Y. Med. Jour., March 14, 1903) reports a number of unfortunate cases which had been treated for months or years under the diagnosis of "scrofula" because all the typical symptoms and signs of syphilis had not been found, or more frequently because insufficient examinations of the patient had been made. Furthermore, it is not at all unusual for amputations to be made upon syphilitic conditions even by prominent surgeons and no excuses can be offered for such deplorable events except that of carelessness. He attributes these mistakes to the fact that Hutchinson's teeth are supposed by many to be constantly accompanying signs of this condition, when, as a matter of fact, they are present in only ten to fifteen per cent. of cases. Secondly, these diseases are very seldom dwelt upon to any length in the teaching of our medical colleges and the students are sent out to practice with the idea that syphilitic mothers will almost always miscarry and the child will not survive. Thirdly, the buccal cavity is not given the prominence it deserves in medical teaching. The buccal cavity has been looked upon as belonging to the dentist and throat man and by the latter as the site of diphtheria or a catarrhal affection. But in truth it belongs to no specialty and it is a cavity the inspection of which throws more light upon the average diagnosis than any other cavity of the body. The indiscriminate use of cod-liver oil and syrup of the iodide of iron in the so-called scrofulous conditions of children has allowed many a syphilitic patient to go on without efficient treatment till irreparable damages have been done. The early diagnosis of such conditions is all important.

Glycosuria and Diabetes.—Upon the treatment of these conditions W. H. WHITE (Lancet, March 14, 1903) offers the following points: Diet, withholding carbohydrates is the first indication and usually secures a gain in strength and weight to the patient, and a decrease in the excretion of sugar and of oxybutyric acid in most cases. He has occasionally obtained an intense ferric chloride reaction, even after weeks of strict diet, although sugar had disappeared from the urine. In many cases dieting, he thinks, is made too strict, and as a rule there is no harm in permitting milk. When dieting ceases to control the glycosuria completely, that quantity of carbohydrates should be allowed the patient which does not increase the sugar in the urine. Levulose is certainly the best carbohydrate to give, and may be allowed up to any limit which does not increase the sugar in the urine. Inulin, which is the starch corresponding to levulose among sugars, should be allowed in the same manner. It occurs in dahlia tubers. It is a pernicious belief among patients that toast may be taken instead of bread, which is, of course, a mistake. Alcohol is allowable in the severe cases, to keep up the strength, but should not be sweetened. Many cases probably receive too little fat. Too sudden a deprivation of carbohydrate food may lead to coma. The reason of this phenomenon is not known, nor do we know why excitement, worry and anxiety also cause coma. The treatment of coma in diabetes is extremely difficult. Some cases yield to the injection of normal salt solution, others improve and then relapse after its injection. Better still is the use of large quantities of alkalis. If the patient feels drowsy, 100 grains of bicarbonate of soda, or 50 of carbonate of soda, dissolved in a pint of

milk, should be taken three or four times a day. If the coma is deeper, the sodium bicarbonate should be injected subcutaneously, so that at least 200 grains are given in the first injection. It may be administered, with less satisfactory results, by the rectum. He also orders 50 to 100 grains of this drug taken during the day in very severe cases giving a ferric chloride reaction but no coma. Alkaline waters, regulation of the bowels, morphine and codeine are other usual indications.

Anchylostomiasis.—Additional notes on this rather popular malady are always welcome. OSWALD BARKER (Brit. Med. Jour., March 28, 1903) describes it as a disease caused by a leech-like blood-sucking parasite which infests the small intestines. The author believes it to be the indirect cause of a great many more deaths than is usually supposed. A better knowledge of this disorder will eliminate from death certificates the unfortunate statement "unknown cause." The anchylostoma duodenale was carefully described in 1879 by McConnell while making necropsies in Calcutta. Curiously enough the man who in part discovered it failed to recognize its profound importance, since as late as 1892 he wrote that he could not believe that the presence of this parasite in the gut had anything to do with the specific disorder known as anchylostomiasis. Sandwith, of Cairo, is of the opinion that the ancient Egyptians suffered from this disease, although no writings have been found on the subject. Our first knowledge of the parasite dates from 1838 when Dubini, of Milan, found the parasite. Until recently anemia of the tropics, owing to the prevailing ignorance of the habits and life history of this entozoon, was attributed to beriberi, malaria or debility, and as late as 1879, when the disastrous outbreak of anemia took place among the thousands of laborers in the St. Gothard tunnel, it was believed by many to be due to bad ventilation, mode of life, or to the *filaria sanguinis hominis*. It was, however, undoubtedly true anchylostomiasis. This disease is believed to exist uninterruptedly over about three-fifths of the habitable globe, but it is infinitely more common in some places than in others. In Egypt and in India the parasite is found in 90 per cent. of all microscopies made in certain well-known hospitals. It is probable that these entozoa form an exception to the general rule that a parasite lives as long as his host, their period of life having been pretty definitely shown not to exceed five years. Drinking water is probably not the chief source of infection, it being certain that the parasite gains entrance to the body in a way similar to, if not identical with, that by which it becomes infected with certain forms of tapeworm, viz., through the contamination of vegetables by their fertilization with the human dejecta. Again the Egyptians are so much given to geophagism that it is probable they actually infect themselves when eating the mud of their beloved river. Dr. Loos, of Cairo, asserts that infection may occur through the hair follicles of the skin, he himself having become infected in this manner. Treated early, this disease is easily cured, but if neglected, it tends to a fatal issue.

Death of Fetus Following an Injection of Diphtheria Antitoxin into Mother.—A very interesting question is raised in regard to the effect of antitoxin upon a pregnant woman by the report of a case by E. R. HOUGHTON (Med. Rec., April 4, 1903). A woman eight and a half months pregnant, for the second time, the first child being healthy and vigorous, was given an immunizing dose of antitoxin after exposure to diphtheria. She at once became very faint and cold but in a few minutes rallied and was able to go some distance to her own home. Only two or three days previously the fetus had been found to be in vigorous condition by careful examination. No fetal movements were felt and

no fetal heart beats heard after the above attack. She gave birth to a somewhat macerated child two weeks later.

Terminal Coma in Diabetes.—The mode of onset and the attending symptoms of diabetic coma are very variable as shown by several cases reported by A. R. ELLIOTT (N. Y. Med. Jour., April 4, 1903). The severity of the cardiac and renal symptoms is extremely uncertain and death is frequently caused apparently by an exacerbation of those symptoms rather than those of diabetes. In the treatment of diabetic coma prophylaxis is of the first importance. It is not a condition which develops insidiously but is usually heralded for days by obvious signs. The earliest indication of trouble is the appearance in the urine of the acid toxins. The first to appear is usually acetone, which is readily detected by the sweet chloroformic odor it imparts to the urine and breath of the patient. Subsequently diacetic acid and β -oxybutyric acids make their appearance and occasion the beautiful Burgundy red color which follows the addition of a solution of perchloride of iron to the urine, and which is known as Gerhardt's reaction. To the careful observer the appearance of this reaction intensifies the conviction previously awakened by the presence of acetone, that the patient is drifting toward diabetic coma. The latter test should be frequently made for it indicates that the albumin assimilation has begun and it marks the dividing line between the mild and severe types. When this reaction appears the diet should be increased, for there is no longer hope of overcoming the glycosuria by dieting. He should be protected against all disturbing nervous influences, from fatigue and cold. He should drink freely, laxatives should be administered and copious colonic irrigations of saline solutions containing also sodium bicarbonate should be employed. Alkalies must be administered freely by the mouth and when coma threatens an intravenous or subcutaneous injection of a solution containing seven grains of sodium chloride and ten grains of sodium bicarbonate to the quart of water may be given. A bad prognosis should, however, be always given in case of coma, for a temporary relief is all that one may hope for.

GENITO-URINARY AND SKIN DISEASES.

Gonococcal Pruritus.—Among the various blenorrhagic complications specific pruritus has not hitherto been mentioned, writes E. DOMENICI (Gazz. Osped., March 1, 1903) who describes a case in which an apparently cured blenorrhagic urethritis was followed by rheumatism accompanied with intense pruritus over the affected joints. The fact that salicylates and iodides failed of effect upon the rheumatism, that all remedies directed to the relief of the pruritus were used without avail, and that both affections ceased suddenly and spontaneously, leads the author to the belief that the blenorrhagic virus circulating in the blood was responsible for the pruritus as well as the rheumatism; and upon its elimination from the system, relief of both affections was immediate and permanent. Hence he concludes that in obscure cases of pruritus, the possibility of residual urethral foci of gonococcal infection should be borne in mind.

Pelade of Dental Origin.—Four cases are reported by GRAVAZA (Gazz. Osped., March 29, 1903) in which a bald patch appeared in the beard at a point corresponding to the position of a carious tooth. The alopecia had been preceded by severe neuralgic pain in the face; but after extraction of the tooth, this entirely subsided and the bald spot became, within a short time, covered with a healthy growth of hair.

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No. 111 FIFTH AVENUE, NEW YORK.

Subscription Price, including postage in U. S. and Canada.

PER ANNUM IN ADVANCE	\$4.00
SINGLE COPIES10
WITH THE AMERICAN JOURNAL OF THE MEDICAL SCIENCES, PER ANNUM	8.00

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SATURDAY, MAY 9, 1903.

THE AMERICAN MEDICAL ASSOCIATION.

THE fifty-fourth annual meeting of the American Medical Association, held at New Orleans during the past week, will be red-letter event in the history of the organization.

Nearly two thousand members actually registered and all the sessions were crowded by interested auditors. The Sections on Medicine and Surgery, though provided with very commodious quarters, frequently had a number of auditors standing, during important discussions. More universal interest was shown in the scientific work of the various sections than has been the case in recent years, and this interest did not evanesce after the first two or three sessions, but lasted until the end of the meeting. The American Medical Association is certainly to be congratulated on the choice of New Orleans as a meeting place and the city will long have a pleasant place within the memories of the visitors.

The weather, contrary to the expectation of Northern visitors, proved very propitious. The heat was tempered by breezes that made the attendance, even at crowded scientific meetings, not unpleasant and the coolness of the nights more than made up for any unusual warmth felt during the day. As to the welcome given, no better ex-

emplification of genial Southern hospitality has ever been afforded. Excellent care was taken in the provision of quarters for visitors, despite the crowding of hotels, inevitable at this season in New Orleans. The visiting physicians came early to the meetings and as a proof of their hearty enjoyment of the cordiality of the resident doctors, stayed longer than is, as a rule, usual at association meetings.

The members present were from all parts of the country, with, as might be expected, a preponderance of Southerners. The programs, especially of the sections of medicine, pediatrics and hygiene, were a reflection of this fact. In the medical section the possibility of the existence of a third disease intermediate to typhoid fever and malaria, yet absolutely independent of either, was a subject of illuminating discussion. A whole chapter in parasitic diseases in the Southern States was added by the papers and discussions on Strongyloides and Uncinaria, and the last word with regard to the cause and prophylaxis of yellow fever was said.

There is no more hopeful index of the brilliant future that is just opening up for medicine in America than the thorough way in which these somewhat abstruse subjects were discussed by Southern members of the Association. It has been realized that there were brilliant lights in medicine at the South but there can be no doubt after this that the rank and file of the profession, in spite of discouraging conditions in this part of the country in the not very distant past, are fully up to the standard of professional knowledge all over the country and are, besides, on the crest of the wave of enterprise that is sweeping over the South with regard to progress of every kind.

Few meetings of the American Medical Association have, we venture to say, been comparable with this in its successful attainment of every end of the annual gathering from the scientific business to the eminently admirable spirit of good fellowship that prevailed. The purely business meetings of the Association seemed to glide easier for the general good will. The organization of the national body and its close relationship to all lesser societies has now been perfected and all difficulty over the code seems in a fair way to be settled and a thoroughly united medical profession in America is not far off. The cordial hosts of the Association can take not a little of the credit for the success of the meeting to themselves. The representatives of the American medical profession have learned that the phrase

"Southern hospitality" is no empty name, and that even in the midst of the business bustle of the New South there is a spirit of welcome characteristic of the Southern gentlemen, of whom the country has so long been proud.

THE SITUATION IN CANCER ETIOLOGY.

NOTWITHSTANDING all that has been promised by investigators and the amount of material that has been published with regard to the possible parasitic cause of cancer, we are practically no nearer the solution of the mystery of malignant tumor etiology than before. One of the best German authorities on the subject, after a careful review of all the literature on malignant neoplasms in the various languages, declared, less than a year ago, that we are so far not in a position to say that there are any parasites that can produce genuine malignant neoplasms. Professor Lubarsch of Posen, who thus puts himself on record (*Pathologische Anatomie und Krebsforschung*) has for years occupied himself mainly with the problem of cancer etiology and is one of the most progressive of the modern pathological school in Germany.

He does not stop here, however, but in his recent monograph on pathological anatomy as related to cancer investigation he says that to his mind there is no doubt that there is between all the various forms of true neoplasms and destructive new formations so many relationships and transitional connections that we can not help but think that if one form of neoplasm is caused by parasites then it is highly probable that every other form has the same etiology. There are many forms of neoplasm, however, differing in many respects from true cancer, but sharing with carcinoma the tendency to destructive growth, to the formation of metastases and the production of cachexia, with regard to which it is extremely improbable indeed almost unthinkable that they should be due to parasitic agents. Even among the specially destructive epitheliomata, which have the true characteristics of carcinomata, there is a whole group whose peculiarities can be associated with a parasitic origin only by the greatest stretch of imagination. In this group Professor Lubarsch evidently includes those epitheliomata which are due to chronic irritation, such as the lip cancers, certain of the stomach cancers, especially those that follow ulcers of the stomach, cancers of the gall tract, which develop after the passage of a stone or in the scar left by some chronic inflammatory process.

In fact, Professor Lubarsch considers that in case an absolutely unobjectionable proof of the parasitic origin of cancer could be given we must still remember that other factors, especially chronic irritation, may play quite as important a rôle as the presence of the parasite itself. Besides chronic irritation, the presence of embryonal or postembryonal misplaced tissue products and the like must also be considered as quite as significant etiological elements for the production of malignant neoplasm as any parasites that may be discovered. It is not hard to understand this expression of Professor Lubarsch's when we recall that the tumors which spring from such conditions as misplaced portions of suprarenal substance can produce all the characteristics of malignancy that are usually depended on for the differentiation of true cancerous tumors in the broad sense of the term. This is especially true as regards their power of producing the so-called cancerous cachexia with an added tendency at least to metastasis.

A very interesting commentary on Professor Lubarsch's conclusion is formed by Professor Hemmeter's article, "Concerning the Rôle of Intracellular Catalytic Processes in the Pathogenesis of Malignant Neoplasms" (see *The American Journal of the Medical Sciences*, April, 1903). Hemmeter proves by observation and experiment that the autonomous development of neoplasm of the stomach, at least of the adenomatous type may be due to subtle damage to cytoplasm. He confesses that this is in fact another way of expressing the traumatic and irritation etiology of neoplasms. As the result of his experiments he shows that gastric ulcers can be experimentally produced and that the edges of these gastric ulcers can be brought to undergo adenomatous transformation by the injection of a cell free and sterile fluid obtained from a cancer of the corresponding organ from the same species of animal.

As is evident these considerations bring the problem of cancer etiology back from the bacteriologist to the hands of the physiologist and chemist. With the recent advances in chemistry and physiology this is not so apparently hopeless a standpoint as it would have seemed some years ago. At least, it is encouraging to realize that the most important pathological problem before the medical profession at the present time is being looked at from many sides and that our pathological investigators here in America are not alone following faithfully the footsteps of great men abroad, but with characteristic enter-

prise they are branching out into new fields with original methods and suggestive results.

We are glad to be able to point out one practical hint from these observations and others with regard to the influence of body fluids upon cells, which seems as though it might prove eventually helpful for the natural therapeutics of cancer. It has always been a mystery that cancer should give metastasis through the lymph channels very frequently, and only very rarely through the blood circulation. A number of previous observers and now Hemmeter suggest that the cancer cells represent forms of protoplasm which have become so far alienated and emancipated from the general physiological laws of the body that they actually represent cells foreign to the body. It is well known now that the serum of one animal acts upon the cells of another animal of different species in such a manner as to produce destruction of cells injected. The serum of the body brings into action this means of defense against cancer cells just as it would against any other foreign material. It is not impossible that a cancer serum should be obtained, that is a fluid whose hemolytic action upon cancer cells will be sufficient at least to lower their vitality and prevent their further growth. Hemmeter considers that this is a very hopeful direction for investigation with a view to prospective prophylaxis or treatment. The point of inquiry will have to be, according to him, "Does not the organism contain in its blood serum defensive substances capable of destroying cancer cells, as long as they are not flooding the circulation in excessive quantities? And, if so, how can this natural means of defense be augmented?"

ECHOES AND NEWS.

NEW YORK.

The New St. Francis Hospital.—The Sisters of the Poor of St. Francis will remove their hospital from East Fifth street, near Avenue B, to more commodious quarters, in the Bronx. The new building, the largest hospital of the order in this country, faces 142d street, and has a frontage of 326 feet by a depth of 107 feet at the wings. There will be nineteen large wards, giving space for 304 beds, and forty small wards, a number of which will be used for private patients.

Dr. Austin Flint's Collected Works.—Dr. Austin Flint's "Collected Essays and Articles on Physiology and Medicine" as arranged by himself, are soon to be published. In explanation as to why the two volumes are given to the public at present rather than posthumously the Doctor says in his preface: "They could not have appeared in their present form unless the collection, arrangement and revision had been made by myself." And one cannot but feel that

he is wise in not leaving this important work to his literary executors. Most of the author's well-known essays are here reprinted save, of course, "The Physiology of Man" and his two text-books. The first paper appeared in 1855 and the last in 1902, the series covering a rather wide range of subjects, which will interest the general as well as the professional reader. For nearly fifty years Dr. Flint has been before the public eye.

A Degree for Trained Nurses.—Governor Odell has affixed his signature to the bill which provides for the recognition of trained nurses by the Regents of the University of the State of New York. Only nurses who shall pass the required examination are permitted to use the initials "R. N." or wear them upon uniforms. This is merely a step toward the discrimination of properly qualified nurses against those who are untrained and who attempt to pass themselves as "trained" without spending the necessary time and effort in preparation for their calling. It does not dictate as to whether a person can be fitted for the work in any other way than that now in use in the hospitals and training schools; but it does insure an employer against the incapable and unscrupulous who try to appear something they are not, while allowing him a preference for the nurse who can present a certificate of thorough equipment.

Milk for the Poor.—During the coming summer Mr. Nathan Straus is planning to enlarge his philanthropic work of milk distribution among the poor. For ten years this noble work has been going on and many thousand gallons of Pasteurized milk have been given to the poor of New York. Dr. Rowland G. Freeman, in an address before the City Medical Society on April 28th, commended the work as follows: "An important factor in the decrease of the death rate was in supplying a proper food to the bottle-fed babies by the Straus milk charity. Started in the year in which the decline in death began, with an output of 30,000 bottles, there was supplied in 1894 300,000 bottles, and in 1895, 600,000 bottles of inspected milk. The output then remained much the same until last year, when milk was certified by the milk commission of this society and was examined by the members, and the demand reached the great total of 1,200,000 bottles. This enormous increase in distribution is being accompanied by a diminution in infant mortality."

New Professors at Columbia University's Medical Department.—The trustees of Columbia University accepted last week the resignation of Drs. Weir, Peabody and Tuttle of the College of Physicians and Surgeons. A new chair in pharmacology and therapeutics was established in the medical school and Dr. Christian A. Herter, '85, who is connected with the Rockefeller Institute, was appointed as its first incumbent. He will have charge of the work in materia medica, formerly in the hands of Dr. Peabody. A new laboratory of experimental pharmacology will also be established soon. Dr. L. Emmett Holt, professor of the diseases of children, was assigned to a seat in the faculty. Dr. Edwin B. Cragin was assigned to take the place of Dr. Tuttle in the department of gynecology. No successor to Dr. Weir in the department of surgery was appointed. Dr. Weir was appointed professor of clinical surgery, and Drs. J. A. Blake and G. E. Brewer were made lecturers in surgery.

Drug Samples.—Attorney-General Cunneen furnished an opinion to the State Board of Pharmacy of New York last week as to the right of that board, through an inspector, to take samples from bottles

of drugs exposed for sale in a pharmacy for the purpose of analysis to ascertain whether the substance is of the standard strength, quality and purity established by the latest edition of the United States Pharmacopeia. Proprietors of some drug stores are unwilling to furnish such samples to the inspector of the State board, although the board is perfectly willing to pay for the samples which the inspector takes. The Attorney-General says: "I think it entirely clear that it is the duty of a proprietor of a drug store to furnish to a member of the State Board of Pharmacy, or an authorized inspector thereof, samples of his goods upon being tendered the purchase price therefor, and that in the event of his refusal to do so, he thereby becomes liable both to criminal prosecution and to an action for the recovery of a penalty."

Grip and Pneumonia.—The bulletin of the State Board of Health of New York for the month of March says that the State is at present in the course of an annually recurring epidemic of grip, which began in the late fall, but made little impress prior to January. A few cases of death were reported from it as early as October, but the estimated mortality was not above 500 until January, when it was placed at 1,200 for the month, and for February it was increased to 1,500. It appears probable that the mortality of March was increased 2,000 by this disease. Available sources of information indicate a decrease thus far during the month of April. Separate record has not been kept of pneumonia save for the past two years. It was the cause of 8,800 deaths in 1902, or a little over 50 per cent. of the reported acute respiratory mortality. In January of this year, there were 1,223 deaths, in February 1,133, in March 1,290.

Obituary.—Dr. James Aloysius Roache, one of the most prominent physicians in Brooklyn, died May 3, at his home, No. 312 Jefferson avenue. The immediate cause of his death was pneumonia. Dr. Roache was born on May 15, 1859, in New York city. His father was Philip D. Roache, paymaster in the United States navy. He was educated in St. Patrick's Academy, St. Francis' College and at the Long Island College Hospital, from which he was graduated in 1891.

PHILADELPHIA.

Entertainment of Visitors.—The Medical Club of Philadelphia will hold a reception at the Bellevue Hotel on the evening of May 15, in honor of Dr. George H. Simmons of Chicago, Secretary of the A. M. A., Professor von Mikulicz-Radecki of Breslau, Professor C. A. Ewald of Berlin, Professor Hans Kehr of Halberstadt, and Professor Hermann Tillmanns of Leipsic, Germany.

Christian Scientists Lose Suit for Charter.—The Supreme Court has sustained the decision of the late Judge Arnold in refusing a charter to the First Christian Church of Scientists in Philadelphia. The refusal was based partly on the fact that the church was conducted for profit and partly because the practice of the art of healing, as set forth by the Scientists, is opposed to the general policy of the law of Pennsylvania relative to the existence and treatment of diseases.

Public Bath-House for Camden.—The first public bath-house in Camden is soon to be turned over to that city by the contractors. The pool is 40 by 80 feet in size and so arranged that the water will flow constantly while the pool is being used. The water will be supplied from an artesian well. The structure cost \$12,000, exclusive of the ground.

Dr. Mayo to Address Academy of Surgery.—The May meeting of the Academy of Surgery has been postponed until the evening of May 11, when the members will be addressed by Dr. W. J. Mayo, of Rochester, Minn. Following the meeting a reception will be tendered Dr. Mayo at the Hotel Bellevue.

Dr. Martin Appointed Director of Public Health and Charities.—Mayor Weaver has appointed Dr. Edward Martin the first director of the newly created Department of Public Health and Charities. Dr. Martin was born in this city in 1860, and was graduated from the Medical Department of the University of Pennsylvania in 1883. He is Professor of Clinical Surgery at the University of Pennsylvania, and also the Woman's Medical College, as well as visiting surgeon at the Philadelphia, St. Agnes' and Howard Hospitals, and consulting surgeon of the Bryn Mawr Hospital. He was surgeon of the Third Regiment for several years.

A Case of Poliomyelitis in an Adult Involving All Four Extremities.—This case was reported, with exhibition of the patient, by Dr. John K. Mitchell at the meeting of the Neurological Society, April 28. The patient was a young man of twenty years, who, after an attack including headache, pain in the back, fever, unconsciousness, etc., became completely paralyzed, not being able to move even his head. Motion afterward returned to some degree and further improvement is now following the systematic employment of massage, electricity and free movements of the limbs. Dr. Mitchell said that the prognosis in these cases depends largely upon the length of time after onset that treatment is begun. This is explained partly by the fact that in addition to the muscles involved by the lesion itself there is a simple atrophy of the other muscles due to their lack of use. The longer the condition persists the greater will be this atrophy. Hence the greater efficacy of early treatment which consists of massage, electricity and persistent free movement, the latter being very important. The beginning of improvement is very tardy in some cases. Notwithstanding the more favorable prognosis in early treated cases, it should be remembered that improvement may follow treatment in cases of long standing. In proof of this was cited the case of a girl of eighteen years in whom the paralysis was of 15 years' duration. Treatment was followed by marked improvement, which did not begin, however, until one year after the treatment was instituted. This case serves to emphasize the necessity of persistent efforts, especially in the cases of long duration.

CHICAGO.

Mikulicz in Chicago.—Professor J. von Mikulicz, of Breslau, attended the meeting of the Illinois State Medical Society, held in this city. He will attend the American Medical Association in New Orleans.

Illinois State Medical Society.—The fifty-third annual meeting of this Society was held in Chicago April 29 and 30, and May 1 and 2, under the Presidency of Dr. M. L. Harris, of Chicago. Approximately seventy papers and four addresses were delivered before the three sections. The officers for the ensuing year are: President, Dr. Carl E. Black, Jacksonville; Secretary, Dr. E. W. Weis, Ottawa; Treasurer, Dr. Everett J. Brown, Decatur. Bloomington was selected as the place for holding the next annual meeting.

Smallpox.—Seventeen cases of this disease were discovered during the week, one of them being a convalescent, the nature of whose disease was not detected until he was well. The remaining sixteen

were removed to the Isolation Hospital before there had been any serious exposure. Thirteen of the seventeen cases (all adults over forty years of age) had never been vaccinated at all, and four presented old doubtful scars of vaccination performed in infancy.

Objection to Test.—It is said that the medical students at the University of Chicago have protested against the revival of the supplementary examinations on the work of the first two years by the Faculty. The examination is designated as "an unnecessary burden and the survival of an obsolete system of medical instruction," and as "an unjust discrimination." The examination is in the entire work of the first three years. It is supplementary to the regular examinations, and is said to entail on the students a vast amount of special preparation, which is useless, as they are compelled to take a third examination in the same subjects when applying for license to practice.

The X-rays.—In a paper on this subject, read before a recent meeting of the Chicago Medical Society, Dr. Wm. Allen Pusey said that his experience with X-rays during the last year has been of the same character as that reported before this Society a year ago. The hopes of usefulness which the results then reported aroused have been confirmed by subsequent experience. The limitations and possibilities if the method have not been reduced by subsequent experience, nor have they been materially enlarged. In only one respect has his experience been less satisfactory than anticipated when he first began the work, and that is in the treatment of hypertrichosis. In a certain proportion of cases there is no question that superfluous hairs can be permanently removed by X-ray exposures, but in a certain number of cases, also, he has not been able to remove them permanently by any reaction that he was willing to produce. The field of usefulness of X-rays in the treatment of cutaneous affections has been gradually extending. In the treatment of malignant diseases the method still offers all the prospects of usefulness that the first startling results suggested. It is, of course, not effective in all cases of malignant disease, but, in his experience, it does all, in most cases, that could reasonably be expected of it, and it certainly has not disappointed any reasonable hopes that were aroused by the first results.

CANADA.

Medical Society of Nova Scotia.—The Medical Society of Nova Scotia will hold its thirty-fifth annual meeting this year at Antigonish on July 1 and 2, under the presidency of Dr. J. J. Cameron of that place. Dr. W. Huntley Macdonald, Antigonish, is the secretary.

Winnipeg Hospitals.—The hospital accommodation of the city of Winnipeg consists of the General with 215 beds; St. Boniface with 200 beds; a maternity with 40 beds, and a small private hospital. This accommodation is not adequate for the growing needs of the Prairie City and increased accommodation is under contemplation. About two years ago the Winnipeg General Hospital was enlarged at a cost of \$90,000; and the proposed new additions will cost in the neighborhood of \$75,000. As many of the charity patients are immigrants a strong appeal will be made to the Dominion Government to assist in the proposed additions.

Banquet to Sir James Grant, Ottawa.—Sir James Grant was recently tendered a banquet by his medical friends of Ottawa and the Ottawa valley, the occasion being his jubilee as a physician in that city. For 35 years Sir James has been physician to the

different vice-regal families who have occupied Government House. Sir James in consequence has always been received with the greatest distinction when in England, Her late Majesty, Queen Victoria, sending for him to pay her a visit at Balmoral, and give him the honor of a private interview. When in London last summer one of the best seats at the Coronation was reserved for him.

Maritime Medical Association.—The Maritime Medical Association will hold its thirteenth annual meeting this year at St. John, New Brunswick, on July 22 and 23, under the presidency of Dr. Murray MacLaren of that city, Dr. T. D. Walker, St. John, being the secretary.

Jubilee of Dr. James H. Richardson, Toronto.—On the evening of April 15 a large number of the former students of Dr. James H. Richardson, who for so many years was professor of anatomy in the medical department of Toronto University, gathered to do honor to their esteemed professor, at the same time a very fine old portrait of Dr. Richardson was presented to the University.

Amendment to the Medical Act of New Brunswick.—The physicians of the province of New Brunswick have had introduced into the legislature now in session an amendment to the Medical Act which provides that no duly registered practitioner in that province shall be liable to any action for negligence or malpractice by reason of professional services unless such action be commenced within one year from the date when, in the matter complained of, such professional services terminated.

Ontario to Have a Hospital for Epileptics.—The Ontario Government have placed in the estimates of the present session an item of \$30,000 for the erection of initial buildings at Woodstock, Ontario, which shall be for the purpose of an Hospital for Epileptics. The official insane are divided into three classes in Ontario, viz., the harmless insane, such as epileptics; the curable insane; the incurable insane. It is the intention of the Government to have all these three classes in time kept in separate buildings. The buildings at Woodstock will be necessarily large, as there are about 1,000 official epileptics in Ontario.

Insane in British Columbia.—The annual report of the Asylum for the Insane at New Westminster, B. C., has been prepared by a medical superintendent, Dr. Manchester. At the beginning of the last official year there were in residence 284 patients and eight on probation. During the past year there were admitted to the institution 121, of whom 95 were males and 26 females, the admissions over the previous year numbering six. The discharges during the year numbered 61 and the deaths 26, which figures are almost identical with the previous year's report. The number remaining in residence at the end of the year was 311 with 16 on probation. Of the number admitted 50.41 per cent. were discharged not including the deaths; 24.8 per cent. recovered; and 25.6 per cent. died. The percentage of insanity to population in British Columbia is 1.67 to the 1,000. The total number of insane in the Dominion is 16,495 or 3.1 to 1,000 of population. The number of insane in Manitoba is 565; in New Brunswick, 1,054; Nova Scotia, 1,392; in Ontario, 7,511; in Quebec, 5,245; in Prince Edward Island, 357.

Amending the British Columbia Medical Act.—There has recently been before the courts of British Columbia a medicolegal case of interest. A physician was alleged to have attended a confinement while under the influence of liquor, the patient dying. Action was brought to compel the Medical Council to

inquire into and pronounce upon the case, but the judge decided that this could not be granted. Apparently, as the outcome of this decision, an amendment was introduced into the legislature of the Medical Act which, if sanctioned by that body, would have the effect of compelling the Medical Council to inquire into any and every trifling complaint laid against any medical practitioner in the province. As a result of a conference between the Premier and a large delegation of medical men, this amendment will be altered so that a Supreme or County Court judge will first decide whether any such complaint, upon the evidence submitted to him, is of sufficient gravity to be the subject of investigation by the Medical Council. The Premier informed the medical men that their suggestions would likely be acted on and that the amendment would be so altered.

Dominion Medical Council.—The Quebec legislature by a large majority has rejected the motion to ratify the Canada Medical Act of 1902, commonly known as the Roddick law. After years of persistent and patient effort Dr. Roddick was successful at the last session of the Dominion Parliament in having this Act placed on the Statute Books, but it was not to come into effect until every provincial legislature had passed ratification legislation favoring the Act and approving of it. All the provinces with the exception of Quebec, approved of the Act through their Medical Councils, and set about taking the necessary steps to have their respective legislatures approve of it. Amendments to the Canada Medical Act, or rather suggestions for them have recently emanated from the Province of Quebec; and they have taken such shape that the Medical Faculty of Toronto University have deemed it advisable to issue a memorandum calling attention to them and advising that Ontario cannot possibly, in the interests of medical education in this province, accept any one of them. It begins to look as though the whole question of Dominion Registration will have to be threshed out again in the provincial and national medical societies before Quebec and the profession in that province can be brought to believe in the principles of the measure.

Obituary.—Dr. Emily Howard Jennings Stowe, Toronto, died in Toronto during the past week. She was the first woman physician to practise medicine in Canada. When she decided upon the study of medicine she made application in 1865 to the senate of Toronto University for permission to attend lectures but was refused. She then went to New York where only four years before women students had been admitted. Her daughter, Dr. Stowe-Gullen of Toronto, was the first woman to take a degree in medicine in Canada. Dr. Stowe had retired from active practice in 1893.

GENERAL.

International Dermatological Congress.—It has been decided to hold this congress in Berlin, September 13 to 17, 1904.

Dr. Harris Goes to Chicago.—Dr. Norman M. Harris, associate professor of bacteriology at the Johns Hopkins Medical School, has accepted the position of first assistant to Dr. E. O. Jordan, professor of bacteriology at the University of Chicago.

The Plague in India.—Through a private communication dated April 10 we are creditably advised that in Bombay the Plague is fearful even after 7 years. There are an average of 375 cases daily in the city and in the province, over 30,000 deaths weekly. Only about one per cent. only of the cases recover and a person attacked generally dies as much

from fright as from plague. Serum and all treatment in fact, have been given up as useless.

Physicians of Transatlantic Steamship Companies.—The average salary of the ship's physician on the American and English lines is said to be from \$50 to \$70 per month; while on the German and French lines the remuneration is still more meager, averaging from \$25 to \$60 per month; and the salary is subject to further reduction during those months in which ocean travel is much decreased.

New Fresh Air Farm.—The Fresh Air Guild of the St. Vincent de Paul Society, purchased a 25-acre farm at Valley Spring, N. Y., yesterday, to be used as a summer home for poor children. The guild has had a farm at Baychester for five years, but it provided for only 1,000 children during the whole season. The new farm already has buildings for 200 children at a time, or 3,000 during the summer.

Cholera at Manila.—Recent advices from the Philippines report that cholera is gradually increasing throughout the archipelago concurrently with the return of the hot season. The deaths from the disease in Manila average twenty weekly. To-day the bodies of two cholera victims were found in the Pasig River. The health authorities have strengthened the guards employed in preventing the contamination of the water supply.

Obligatory Reports of Phthisis Under Ferdinand II. of Spain.—In view of the present widespread crusade against tuberculosis, much interest attaches to the decree, which has recently come to light, issued by Ferdinand II. of Spain in 1751, making reports of tuberculosis cases obligatory. By the terms of this decree, after the death of a phthisical patient all his personal belongings, wearing apparel, bed linen and furniture were to be burned and the room occupied by him was to be cleaned and whitewashed. The physicians who failed to report patients suffering from tuberculosis, or deaths from that disease, were subject to a fine of 200 ducats and a year's suspension for the first offense; and 400 ducats with four years' suspension for the second.

Meeting of the Maryland Medical Faculty.—On Wednesday and Thursday of last week the one hundred and fifth meeting of the Maryland Medical and Chirurgical Faculty was held in Baltimore, with the venerable Dr. Wm. Travis Howard as its President. Many valuable papers were read and discussed by its members. Some interesting discussions relative to reciprocity between the practitioners in Maryland and the District of Columbia was had. At the present time the licensed practitioners of the District are permitted to extend their professional labors into the State but the members of the Maryland Faculty are not allowed to practise in the District.

Home for the Consumptive Poor of New Jersey.—The legislature has appropriated \$50,000 toward the erection of a suitable tuberculosis hospital at Lebanon, N. J., with the promise of more when the plans shall be completed. Only the poor will be accepted as inmates and no incurables will be retained in the institution. The present scheme provides for 250 patients with six resident physicians in charge, who will probably be chosen by competitive examination. Dr. Charles Kipp of Newark is president of the board of management, Dr. James Green of Elizabeth is secretary, and Col. A. A. Stevens has been appointed treasurer.

"Cat-Fear."—Dr. Weir Mitchell in addition to being an acknowledged authority on nervous diseases and the influence of snake poison, as well as a master of the art of expression, has lately been investigating a psychological phenomenon which he is

pleased to call "cat-fear." His studies are based on the fact that certain individuals undergo a sort of hysterical excitement when in the presence of a cat and this dread in some he finds to be so great as to excite terror or even convulsions. Mr. Rafford Pyke seeks to aid in the explanation of this fact in a somewhat illogical manner. He says: "The peculiar loathing which man feels for the snake extends in highly sensitive natures to creatures which resemble or suggest the snake. Now, the cat is essentially a snakey creature. Just watch a cat as it moves about at ease, as it lies in the sun, or as it curves itself into its usual position when about to sleep. Its stealthiness, its sinuous movements, the undulations of its lithe body are closely comparable with what we notice in the serpent." This dread is, we believe, the dread to which Dr. Mitchell has given the name of "cat-fear." It may be called "cat-fear," but in the last analysis it is a secondary manifestation of snake-fear. It is scarcely likely that this attempt will add to our stock of knowledge on the subject.

SOCIETY PROCEEDINGS.

NATIONAL CONFEDERATION OF STATE MEDICAL EXAMINING AND LICENSING BOARDS.

Thirteenth Annual Meeting, held at New Orleans, May 4, 1903.

An address of welcome by the Hon. Paul Capdeville, Mayor of New Orleans, on behalf of the city and citizens of New Orleans, opened the week's work in medicine, dedicated the days to the medical visitors. The interest of all was evident in the meeting of this organization, which looks to the raising of the standard of medical education.

After addresses of welcome on behalf of the medical profession of New Orleans by Dr. Charles Chasagnac, on behalf of the medical department of Tulane University, by Dr. Rudolph Matas, and on behalf of the State Board of Medical Examiners of Louisiana, by Dr. A. F. Barrow of St. Francisville, La.; the annual address of the President of the Confederation, Dr. N. R. Coleman, of Columbus, O., was delivered.

Improvements Needed in Medical Education.—Dr. Coleman dwelt on the amelioration of medical education since the establishment of the National Confederation, and pointed out reforms still needed. The standard of preliminary education before the medical studies are entered upon should be raised. Much has been done, but much yet remains to be done. Especially is this true with regard to a training in the sciences. Training not only in chemistry and in biology, but also and particularly in physics is needed. An attempt to make up for the lack of such training by giving a smattering of the sciences during the medical course is futile. Longer hours are needed and the standard of work should be so many hours per week, rather than so many weeks in the year, in general. Especially should there be more clinical teaching than is at present customary, and this should be of a personal character, so that each medical student shall have the opportunities to study individual cases under proper guidance.

Too Many Medical Schools.—There are over 150 medical colleges in this country. There should not be more than one-half as many. Then professors could be given good compensation, as they deserve and should not hold their positions merely for the sake of their practice. Such important subjects as anatomy, physiology and chemistry are sometimes taught in less im-

portant colleges by the same man. This is evidently an impossible task. The basic sciences must be taught well, or the medical education always remains defective. This is particularly true with regard to a knowledge of the relations of important organs in the thorax and abdomen, in which students are so often found to be defective. Physical diagnosis is often relegated to teaching by young and comparatively inexperienced professors. This branch is too important to be thus neglected or lightly passed over.

Some Questions and Answers.—"What is podagra and its cause?" Answer: "A disease of the parotid gland commonly known as mumps." Then follows a long description of parotitis. Answer: "Ergot poisoning due to the ingestion of bread containing the poison." Others spoke of it as paralysis as a form of obscure disease. Some confessed ignorance. "What is hemoptysis, hematemesis and hematuria?" Many students mixed these up. Some failed entirely to realize their significance. "What is Cheyne-Stokes breathing?" "Short respiration." "What is morbus ceruleus?" Answer: "Blue disease." Forty-four out of forty-five students failed to answer this question correctly. Medical students do not think, and hence the queer answers to these questions. System and method of teaching are more important than amounts of information.

Endorsement of Medical License in New Jersey.—Dr. L. B. Godfrey, of the State Board of New Jersey, gave its requirements. An academic education must be attested. Four years' study of medicine must have been made and must have been licensed by some approved State board; must be endorsed by regular medical practitioner of New Jersey, and must have approval of medical society of his neighborhood or by two reputable practitioners. There must also be a certificate of good character. The experience with this system has given excellent satisfaction and has the element of requiring personal references that make it much better than any system of reciprocity.

Dr. W. F. Morrow, of Missouri, complimented the Confederation on the uplifting of the standard of medical education. During the past year 45 per cent. of those examined in Missouri were refused diplomas. The medical profession of this country must organize in order to protect itself from the efforts to influence legislation that will surely follow this proper elimination of the unfit medical students.

Diploma Requirement Before Examination.—Dr. E. B. Harvey, Secretary of the State Board of Medical Examiners of Massachusetts, said that he believed in the principle of the Missouri State Board, which tests applicants for diplomas to practice without any attention to their having a medical diploma or not. Every State shall yet have a Medical Council who will decide the qualifications of students rather than the faculties of the colleges, as obtains now in England.

Dr. Webster, President of Illinois Examining Board, said that it is an imposition for a medical examining board to have to examine every one who applies without regard to a previous diploma from a medical school. It is a matter of regret that the law in Missouri should require this. Dr. Beates, President of State Examining Board of Pennsylvania, said that the board is only a test. The colleges give knowledge. Applicants without a degree may memorize enough by chance to pass without real knowledge. We are not in a state to be compared with Europe as yet.

Constitutionality of Medical School Diploma Requirement.—Dr. Van Meter, of Colorado, said that if it is required that all those to be examined must have diplomas in medicine then the constitutionality of the law comes into question, since it is class legislation. The profession must not ask too much of the law-making

power. Besides it is scarcely American thus to limit the number of applicants.

Dr. Harvey, of Massachusetts, said that one-half of the 150 odd regularly chartered medical schools of this country are nothing more than diploma mills. It is important that the State board should be the last resort and that too many pre-requirements shall not be insisted on.

Dr. Spurgeon, President of the Indiana State Board of Medical Examiners, said that the profession should require as many tests as possible. Even at present unworthy men obtain licenses. Dr. Spurgeon detailed some recent experience with substitution. All applicants should be required to present evidence of some attempt to prepare properly by attendance at medical school before coming up for examination.

At the afternoon session, Dr. George W. Webster, of Chicago, the chairman of the committee on curriculum, recommended the adoption of the following regulations: 1. The standard curriculum, which is to be adopted as a minimum requirement for the degree of M.D., shall consist of the following: (a) The course shall consist of four terms in four separate calendar years. (b) Each term shall consist of 30 weeks of work, exclusive of holidays, and of at least 30 hours in each week, or 900 hours of actual work. (c) The entire course of four years shall consist of not less than 3,600 hours of actual work. (d) This should be a standard of required work. Any elective work should be in addition to the above. (e) The average time devoted to each study in the curriculum should be approximately that given below under g. (f) Clinical work should constitute at least one-fourth of the work of the entire course.

After careful collation of the answers obtained to questions sent with regard to the amount of time given to various subjects in many medical colleges, the following averages, as given in the first column, were obtained. Reducing these averages by about 10 per cent., the committee considers that it is not too much to ask that at least the number of hours given in the second column should be allowed at all medical colleges that wish to be rated as up to the average standard.

	Average. Standard.	Proposed
(g) Average total hours in 43 colleges in 4-year course.....	4095	3600
Average total hours in 43 colleges in:		
First Year	973	900
Second Year	1039	900
Third Year	1040	900
Fourth Year	1090	900
Average hours in 43 colleges devoted to the following subjects:		
Chemistry	375	340
Anatomy	549	500
Histology and Embryology....	219	200
Physiology	276	250
Pharmacology and Therapeutics	118	110
Physical Diagnosis	61	55
Surgery	596	540
Bacteriology	131	115
Etiology and Hygiene.....	33	30
Pathology	295	260
Medicine	544	500
Obstetrics	177	150
Dermatology and Syphilology..	64	50
Laryngology and Rhinology...	67	55
Pediatrics	72	60

Ophthalmology and Otology...	106	95
Gynecology	145	130
Neurology	82	75
Mental Diseases and Jurisprudence	27	25

In discussing the report, the President of the Confederation pleaded for its adoption as sure to raise the standard of medical education and ethical standing. Dr. Kornderfer, of Philadelphia, then said that the old recommendations with regard to better preliminary education for medicine had already stimulated medical examining boards to the raising of their standards. The adoption of these new suggestions will undoubtedly have a like effect.

The report was unanimously adopted.

Reports were then read by Dr. F. A. Larue, of New Orleans; by Dr. S. B. McGayran, of Cadiz, O., as to the effects of recent medical practise acts passed in their respective States, showing that much has been accomplished, though much still remains to be done. Dr. E. L. McGehee, of New Orleans, then read a paper showing that the examining boards of the country have, besides their own work, done much to raise the standard of medical education and can do much more if the medical profession will prove sympathetic with their efforts.

ASSOCIATION OF AMERICAN MEDICAL COLLEGES.

Thirteenth Annual Session, held at New Orleans, May 4, 1903.

The President, Dr. Wm. L. Rodman, in the chair.

President's Annual Address.—After the approval of the minutes of last year's meeting at Saratoga, Dr. Wm. L. Rodman read the President's Annual Address. He said that if the Association of American Medical Colleges is to have its proper effect it must undertake more complete inspection of medical schools. The membership requisites must be made higher if the better class medical schools are to be retained. Above all the decisions of the judicial council of the Association suspending members must not be set aside as in the past.

All medical schools should be required to charge some minimum amount for tuition. This should not be less than \$100 per annum, and the amount should be collected, and not too easily charged off against services or supposed services. The abuse of so-called free scholarships must also be regulated.

Higher Standard Needed.—The Association must advance its standard. This will not work against the smaller colleges as has been thought. It has not in the past, and at the present time students realize the clinical advantages of the small college and the opportunities for personal teaching more than ever. There are too many medical schools, more in one city of the United States than in the whole of the great Empire of Russia. If there should be a reduction of the number of medical colleges it would be for professional good. The profession is now overcrowded and more and more students proportionately are taking up medicine every year.

Preliminary Education.—The requirements for this should be made ever higher and higher. At present we should demand at least a diploma showing three years of study in a high school—to be made later a four years' diploma. Very little allowance should be made for previous training except the special biological training that is practically

a more complete development of the faculties of accurate observation, so important for students of medicine.

Recommendations.—At least four terms of seven months' each should be required. Midyear examinations in writing should be required of all. This is now the custom in literary colleges, and will be of excellent service in keeping medical students at work. These examinations should serve to weed out low-grade students before their senior years. The senior examinations are, as a rule, severe enough, but the preliminary examinations are often scarcely more than a farce.

On motion, the recommendations of the president were referred to a committee for consideration.

Medical Education Advancement.—Dr. Dodson, of Rush Medical College, said that the recently created committee of the American Medical Education, so far as he understands, is about to accept the standard thus created, and will eventually recommend that all its members should have this education. There are now 6,000 graduates in medicine every year. It is a misfortune to let men take four years of medical training without a proper basis, when it will be so hard for them to become successful practitioners afterward.

Dr. Dodson then presented the following amendment, introduced by the special committee appointed for the purpose of revising Article III of the Constitution: It is moved to amend Article III by striking out all of it and inserting in lieu thereof, the following:

Article III, Section 1.—Every College holding membership in this Association, shall demand of each student, as a minimum requirement for admission to the medical course, either (a) a diploma from a four years' high school or academy whose credits are accepted by an approved university; or, (b) the diploma of a state normal school having a course of instruction equivalent to a four years' high school course whose credits are accepted by an approved university; or, (c) a certificate of admission to the freshmen class of a state university or of a college whose credits are fully recognized by an approved university; or, (d) an examination in the following branches: (A) English—grammar, rhetoric and composition, the equivalent of two years' high school work in this branch; (B) Algebra—to quadratics; Latin—one year high school work, including grammar and four books of Cæsar, or a full equivalent thereof; (D) Physics—one year of high school work, including some laboratory work; (E) U. S. History—one year of high school work.

Besides the above, seven additional branches of the students' choice selected from the following: (1) Latin—one year; Cæsar; Cicero, or Virgil. (2) German—one year; grammar and literature. (3) French—one year; grammar and literature. (4) Chemistry—one year; with laboratory work. (5) Botany—one year. (6) Zoology—one year. (7) Geometry—one year; plane. (8) Geometry—one year; solid. (9) Trigonometry—one year. (10) Astronomy—one year. (11) Physiology—one year. (12) Physical geography—one year. (13) English literature—one year. (14) Advanced algebra—one year. (15) Civics—one year. (16) General History—one year.

Sec. 2.—This examination must be conducted by members of the faculty of a literary or scientific college, or by a city, county, or state superintendent of public instruction; in no case shall it be conducted by any person connected with the faculty

of a medical school to which the student is seeking admission.

Sec. 3.—A student may be allowed to enter upon his medical work conditioned in not more than two branches (one year's work in each), but these conditions must be removed by satisfactory examination before he is allowed to enter upon the second year of his medical course.

Sec. 4.—College members of this Association may honor the official credentials presented by students from other colleges having the standard requirements maintained by members of this Association, excepting for the fourth year of their course.

Sec. 5.—Candidates for the degree of Doctor of Medicine shall have attended four years' courses of study, each annual course to have been of not less than seven months' duration, and at least twelve months shall intervene between the beginning of any course and the beginning of the preceding course.

Sec. 6.—Time credits may be given to students who have the necessary entrance requirements and who are graduates or students of colleges of homeopathic or eclectic medicine for such courses of instruction of the required duration as they have successfully fulfilled, excepting in the course of the fourth year, provided they pass satisfactory examinations in materia medica and therapeutics. Credit for one year of time may be given to students holding the degree of A.B., B.S., or other equivalent, from a reputable university or literary college.

Sec. 7.—A college which gives less than a four years' course of study, but does not graduate students and is possessed of other required qualifications may be admitted to membership.

Note.—One year's work in any subject of a high school or academic course is defined to mean a series of daily recitations, of forty-five minutes or more in time, for each week of a school year of not less than thirty-six weeks.

This amendment was seconded by the following colleges: medical department of the University of Buffalo, Johns Hopkins University Medical School, medical department of Western Reserve University, medical department of the University of Michigan, Rush Medical College in affiliation with the University of Chicago, Northwestern University Medical School, Medical Department of the University of Minnesota, medical department of the University of Iowa, medical department of the University of Kansas, medical department of the University of California.

Dr. Wathen, of Louisville, in a majority report recommended that time be allowed for studies done, but these be replaced by special elective studies without any shortening of the course. This will do away with the temptation to shorten the course without real reason.

On motion, the report of the committee was received, and after discussion it was decided that its provisions should not have full binding force for three years, so as to allow of proper preparation of intending medical students for the change.

Alcohol and Muscular Strength.—When taken in small quantities in the fasting condition, and when as a sequence of individual constitutional conditions, the store of bodily strength is to a certain degree exhausted, alcohol, according to L. SCHNYDER has a favorable effect on the muscular power. This favorable action, however, is inferior to that of a nutriment of equal caloric value.

THE AMERICAN MEDICAL ASSOCIATION.

*Fifty-fourth Annual Meeting, held at New Orleans,
May 5 to 8, 1903.*

(Special Telegraphic Report.)

PRELIMINARY SESSION, MAY 4, 1903.

A preliminary meeting of the House of Delegates was called to order by the President, Dr. Frank Billings, who insisted on the provisional nature of the meeting, the first regular meeting to be called at 8 on Monday evening. He called for reports of several committees, but a few only were taken up.

Prophylaxis of Venereal Diseases.—This committee presented a lengthy report, adding practically nothing to this old world-wide discussion, and modeling its report largely on the report of the Brussels Conference, as reported in the *MEDICAL NEWS* of last September.

Scope of Work.—The scope of the work which the committee had set before itself consisted at first in corresponding through its secretary with medical men and philanthropists, with the view of gathering such information and suggestions as they may have had to offer. This step, however, did not seem productive of what the committee considered helpful hints. It did not elicit new facts and only gave occasion to ventilate different and uncompromising views, which, while proper before an assembled body like a congress, did not open new avenues to aid the committee in its preliminary work.

In looking for another more promising basis for its studies, the committee has very keenly felt the utter want of statistics from boards of health, etc. There was absolutely nothing on which to build, or from which to draw conclusions. While other contagious diseases are controlled and combated by boards of health with great vigor and excellent results, venereal diseases are ignored by our sanitary authorities, and the morbidity therefrom is consequently not a matter of record; officially, there are no venereal diseases in these United States.

There remained only one other source of information, viz., the utilization of the records of the different municipal and general hospitals in the larger cities of the Union. But this task would have needed a large clerical force and a substantial appropriation to cope with. It was, however, tried tentatively in many instances and proved futile.

The returns were utterly disproportionate to the number of inquiries sent out; but, had they all replied, as will be seen later, the statistics therefrom would not have proved of great value. In most general hospitals, venereal diseases are not treated; or, if so, those cases figure under different names, pertaining to the late manifestations of these diseases. This had been the experience of the Committee of Seven appointed by the Medical Society of the County of New York in 1901, for the study of measures for the prophylaxis of venereal diseases. Furthermore, the imperfect records, the various designations and omission of diagnosis and other necessary particulars for fairly definite statistics would have made it illusory to draw conclusive statistics. These sources, while they yield interesting deductions, do not represent the amount of venereal diseases treated in the public institutions.

The committee then decided to enlist the help of the medical press of the country, and to this end issued a circular letter, with a request to support the movement.

The committee embraces this opportunity to extend publicly its thanks to the medical journals for the readiness with which the appeal was given place in their columns, either in extenso or in abstract. Without their powerful aid, surely a movement like this must fail; with their cooperation, it has a good chance to succeed.

Status of Question in Different States.—Simultaneously with this move and in order to ascertain any laws in regard to prostitution and free treatment of venereal diseases, your committee drafted the following questions and assigned to each member a division of the United States, so that every State and Territory was covered. The following questions were asked of the different States: (1) What laws exist in the different States relating to prostitution? (2) Is there a sanitary marriage law which provides for medical examination of the contracting parties? (3) Is there any law against wilfully or knowingly communicating venereal diseases? (4) What, if any, municipal regulations exist in any city of your State regarding these diseases? (5) Is notification required of these diseases in your State?

Up to the time of completion of this report, twenty States have responded, and many more are confidently expected to do so. But even from this limited number, the utter lack of laws to combat venereal diseases can be ascertained.

The following is a summary of the returns from the States which have responded, viz.: Arizona, Connecticut, Colorado, District of Columbia, Maine, Maryland, Massachusetts, New Hampshire, North Carolina, New York, Ohio, Oregon, Pennsylvania, Rhode Island, Utah, Virginia, West Virginia, Washington, Vermont.

Each of these States, with the exception of Rhode Island and Connecticut, has, in answer to question 1, the usual laws and sundry police regulations of general character against houses of ill fame, including specified nuisances therein against soliciting in streets, and against enticing of females under 16 years. To questions 2, 3, 4 and 5, the answer in all instances as far as relating to venereal diseases is negative.

It is gratifying to note that this circular letter elicited a number of responses from physicians, medical associations and health officers. Through the latter source, we could ascertain that, independently of the general State laws, some municipalities have their separate local laws or ordinances regarding the social evil.

The fact that States and municipalities in most instances have different laws on this question, as is the case in several States, made the task of gathering reliable facts one of great difficulty.

General Conclusions.—The dire consequences of venereal diseases do not only affect the working and earning capacity of the people, but also their well being. The well being of the people is encroached on not so much by the active incidents of these diseases, but much more through their chronic manifestations, especially in women. The tedious and invalidating course of chronic pelvic inflammations, their painful and ever-recurring accidents diminish the exercise of motherly care of the children, forces to relative or absolute inactivity the helpful mate. The working capacity being thus diminished, of course, the earning capacity suffers also, and the type of an ill-nourished, careworn and poverty-stricken family is established. And as poverty and squalor are the stranglers of morals, virtue in the children takes its leave, the demon alcohol takes possession of the despairing husband and father, and mute resignation and despair dulls the sensibilities of the wife and mother. It has been approximately determined that among the communicable diseases in Prussia, typhoid represents a yearly money loss of 8,000,000 marks, while the increased expenses and decreased income caused by venereal diseases amounts to 90,000,000 marks yearly, an amount which supercedes that caused by consumption. But the financial loss is of minor importance compared with the enormous social danger, and consequent social misery. Gonorrhea, especially its latent form, destroys the procreative functions in both sexes; in men through chronic inflammation of the adnexa, causing a zoosperm-

mia and necrospemia (and further stricture and ascending inflammation of the kidneys). In women through most serious involvement of the pelvic generative organs and their annexa, destroying fecundity and giving rise to mutilating surgical operations. Eighty per cent. of all deaths from pelvic diseases in women are due to gonorrhea. Twenty per cent. of all blindness is due to gonorrheal infection of the newborn. Fifty per cent. of all involuntary childless marriages are caused by gonorrhea of the female organs of generation, of which 45 per cent. are due to marital infection by men. Taking this view of the existing conditions, the mooted question of "race suicide" so eminently emphasized of late as a voluntary cause of barren marriages, finds its explanation in a quite unexpected but entirely natural, if even in not quite as voluntary a way as was generally presumed. The original source of this gonorrheal infection is traceable in about 70 per cent. to prostitutes, and as 80 per cent. of all men had had gonorrhea once or several times, the conclusions reached are obvious. While almost every prostitute must be looked on as infected with gonorrhea, compilations have shown that about every fourth disseminates syphilis. This means syphilis is about four times rarer than gonorrhea. But, notwithstanding, it stands higher in its fatality. With lessened morbidity it unites a more profound activity in the visceral organs; it is always a constitutional infection with a high mortality and transmissible through heredity. In contradistinction to gonorrhea, it can be acquired also in a non-venereal way. In countries of inferior culture, it is disseminated in nine-tenths of all cases in an extragenital way. Syphilis insontium is acquired in about five per cent. of all cases. It causes abortion in from 60 to 80 per cent., and propagates this tendency up to the third generation. Marital infection takes place in about five per cent. of syphilitic women and from 60 to 80 per cent. of this is due to prostitution.

There are, according to some authorities, 150,000 syphilitics in Berlin, or 12 per cent. of the inhabitants; in Paris, from 13 to 18 per cent. In Copenhagen, 1 of every 55 young men of the age between 20 and 30 has syphilis and 1 in 8 has gonorrhea. In the City of New York the number is estimated to reach 200,000. The same ratio holds good with very little oscillations in every capital or large city.

Prevalence of Venereal Disease.—An approximate idea of the prevalence of venereal diseases can be gotten from the records of the various armies. There, from a body of men living under almost similar social conditions and with every case duly reported, the morbidity from venereal diseases can easily be ascertained. Although very valuable, these statistics, however, do not elucidate conditions in the great mass of the population.

As to the armies, these are the figures per thousand: Germany, 27; Russia, 43; France, 44; Austria, 65; Italy, 71; Great Britain, 204. (Parliamentary Report, July 15, 1897, made by the Earl of Dunraven.)

The admission rate for the whole army of the United States for 1901 was 133.97 per 1,000. In the Philippines, those diseases have increased materially in their prevalence. In 1901 they constituted 20.42 per cent. of the total sickness, as compared with 8.97 in 1900. In consequence of this dire condition, medical inspection of the troops at regular intervals and relementation of the prostitutes has been instituted there. The navy of the United States, i.e., the force afloat, participated with 112 per thousand, against 119.7 of the German navy. A much more reliable statistic, because embracing the whole population, can be gathered from Sweden and Denmark, where, since 1874, venereal diseases are among the reportable contagious diseases. Physicians there are held to make weekly returns. Every venereal patient is obliged to have himself treated and treatment

is given gratuitously. Statistics there show that since 1887 the number of venereal diseases has diminished 34 per cent. In the Dukedom of Braunschweig, where every hospital is open for those afflicted with venereal diseases, constitutional syphilis has greatly diminished in proportion to other venereal diseases. The latest and most original departure to ascertain the prevalence of venereal diseases was instituted by Prussia. By request of the Government, all venereal diseases coming into treatment on the 30th day of April, 1900, had to be collected by physicians and their reports returned for statistical purposes. It appears, then, that on this day there were in the Kingdom of Prussia 40,920 venereal patients under treatment. (Seventy-five per cent. males and returns and in consequence of other errors the real number of 25 per cent. females.) Among which were 11,000 cases of recent syphilis. But since, only 63 per cent. of all physicians made venereal patients on this day would amount to 64,000, making a yearly aggregate of 773,000 and possibly more venereal patients. This means that in Prussia three-quarters of a million people are afflicted yearly from venereal diseases; or that, out of 22 adults, 1 becomes infected every year. By computation, it has further developed that in Berlin, among men who marry after their 30th year, every one had gonorrhea twice and every fifth was infected with syphilis. These are appalling numbers and far outdistance even consumption.

Hospital Facilities for Treating Venereal Diseases.

—Finally, the hospital facilities of different countries for the treatment and care of venereal diseases is very inadequate.

In Prussia, every twenty-ninth venereal patient is admitted to the hospital. The other twenty-eight must either content themselves with dispensary treatment or fall into the hands of quacks. In all Germany only seven per cent. of venereal diseases are admitted to the hospitals.

The main cause of this dereliction lies everywhere in the insufficient supply of hospital facilities and that most general hospitals do not admit venereal patients, or only occasionally so; and in the contemptuous and unkind treatment of patients so afflicted. The poorest accommodations, the meanest food are given them and no wonder that they try to avoid the hospital terror. London has one general hospital bed for each 1,000 of its population. New York, one bed for each 5,000. London treats 88 per cent., New York only 9½ per cent. of its infectious diseases in hospitals. In order to effectually cope with venereal diseases, London ought to have for its 6,300,000 inhabitants about 2,500 beds for venereal patients, and Greater New York, with its 3,500,000 inhabitants, at least 1,800 beds at its disposition. In the northern countries of Europe where venereal diseases are classed among the reportable ones, and gratuitous treatment and generous hospital facilities are within reach of every one, venereal diseases have greatly diminished. Stockholm is in the enviable position of having more beds than needed (366), and complains only of the lack of polyclinics for outdoor patients. In Hungary, the treatment of sick prostitutes as outpatients is strictly forbidden and hospital treatment required; transmission of venereal diseases is made punishable. Punitive legislation against wittingly communicating venereal diseases is in existence in Norway, Denmark and Finland. The countries of middle Europe have no such laws yet. The foregoing fragmentary statistics will convincingly prove that venereal diseases stand next to tuberculosis and alcoholism, if not superseding them. They are permeating the very root of the population, as 15 to 20 per cent. of adult males are infected with syphilis, and about 80 per cent. of them had gonorrhea, tainting those yet unborn, maiming those born with the virus

already in their blood, deteriorating the race, devitalizing the individual.

Report of Business Committee.—Dr. H. N. Moyer, of Chicago, presented a preliminary communication as to the work of this committee. The only feature that they would wish to introduce was a further sub-division of the work of the house by a larger reference of questions to standing committees to be considered and then presented to the Committee of the Whole, the house, for adoption and final passing. This would expedite very wonderfully the vexatious questions of interest. The house would convene at 8.30 A.M., and its members could then attend the regular meetings of the Association. The house then adjourned until 8 P.M.

Report of the Board of Trustees.—At 8 P.M. the House reassembled and the first order of business was the report of the Board of Trustees. Dr. T. J. Happell, of Tennessee, responded. Among other topics touched upon in this report the following attracted special interest.

Code of Ethics.—"To avoid the possibility of an unnecessary expense, the Editor was directed not to print and send out, as he has done for several years, the "Code of Ethics" to medical students, in view of the fact that a special committee has under consideration a revision of the code, and are to report at our next annual meeting. As changes may be made, we thought it would be better to await the action of the House of Delegates on the matter, and then have copies of the code printed."

National Incorporation.—"In regard to the question of a national incorporation, which would permit the American Medical Association to meet in any State or Territory in the Union, to transact and complete its business without being compelled to hold an adjourned meeting in Illinois for the purpose of ratifying its acts done at the place of meeting, your Board of Trustees has considered it at much length. Much correspondence has passed and repassed between interested parties and various members of the board. All felt that if such an end could be attained, it certainly should be done. At our annual meeting the secretary of our board, Dr. Montgomery, arranged much of this correspondence, and presented it to us on the afternoon of the first day. The attorney, Mr. Baldwin, who had been advising with us, being present, by request, took part in the lengthy discussion of the question. At the end of the session, he was requested to take the correspondence, arrange and go over the same, and furnish an opinion which could be employed by the board as an explanation, should it decline to proceed in accordance with the requests made for them to act in this matter of national incorporation. We can arrive at no better way of presenting this matter so that it may be fully and clearly understood than by giving to the House of Delegates, and, through you, to the whole Association, Mr. Baldwin's report verbatim. The substance of this opinion is: (a) That the constitution and by-laws adopted at St. Paul had no binding force at all until they were readopted in Illinois; but the action had at Saratoga, and readopted in Chicago, is binding, and the charter and by-laws under which we are now acting are legal, since they were readopted in Illinois, where the Association is incorporated. (b) That a national incorporation is an impossibility."

This report was referred to the Business Committee.

Scientific Research.—Dr. A. Stengel, of Philadelphia, presented this report recommending the appropriation of \$100 to each of the five series of investigators, as follows: Drs. N. Evans and F. J. Otis on Blastomycetic Infections; Dr. G. F. Ruediger on Streptococcus Infections; Dr. J. T. Moor on Relapsing Malaria and Its Latency; Dr. A. T. Wetherby on Pathology of Sweat Excretions.

Referred to Board of Trustees.

FIRST DAY—MAY 5, 1903.

GENERAL SESSION.

Addresses of Welcome.—The meeting was opened with prayer by Rev. H. G. Davis. After this a hearty welcome to New Orleans was accorded by the Mayor, Hon. Paul Capdeville, who announced his readiness to grant a personal welcome all the more since he had recently been the recipient of notable benefits from members of the profession. Hon. Leon Jastremski, representing the Governor of Louisiana, then extended a hearty welcome and the freedom of the commonwealth to the medical visitors within its borders. These addresses of welcome were responded to by Dr. J. A. Witherspoon of Nashville, Tenn., the first vice-president of the Association, who expressed in felicitous terms, that caused cheer after cheer, the feelings of the members at the hearty welcome extended to them. Dr. Isidore Dyer of New Orleans, the Chairman of the Committee of Arrangements, then called the attention of the visiting members of the Association to the older social events so new to them, and calculated, therefore, to be the source of much pleasure.

Presidential Address.—Dr. Frank Billings, of Chicago, then delivered the president's annual address (see page 865).

SECTION ON PRACTICE OF MEDICINE.

FIRST DAY—MAY 5TH.

Chemical Medicine.—The proceedings of the Section on Practice of Medicine were opened by the reading of the chairman's address by Dr. Wm. Sydney Thayer of Baltimore. Dr. Thayer's subject was Observations on the Teaching of Chemical Medicine. He said that one hundred years ago, when the United States was enlarged by the Louisiana Purchase, there were only three medical schools in the country, one at Philadelphia, one at Harvard, and one at Dartmouth. Notwithstanding the supposition that medical education was at a low ebb, Dr. Thayer declared that students were required to take three years of preparatory reading of medicine with a physician and spend two full terms at a medical school, besides giving satisfactory evidence of having had a college training or at least good preliminary education. Deterioration of ideals came later, and within twenty-five years there were medical schools graduating physicians after one year's attendance or after two terms of evening classes, so that at times a car-driver graduated into a physician without a break.

Laboratory and Bedside Teaching.—In the matter of laboratory work the training given by our medical colleges is satisfactory, but in chemical pathology it is weak. The practice of having students as continuous assistants in hospitals in this country is practically unknown. In England six months of such service is required before graduation, while in France the student must pass the mornings of two years at this work. There is a feeling in this country that such a practice might work to the detriment of the patients. This is false, however. As a matter of fact, more assistants are needed in hospitals now for the detailed, exact study of patients. As this is mainly routine, students may well be employed to mutual benefit. The experience at Johns Hopkins under Prof. Osler has demonstrated this, and what is needed now in the medical teaching of this country is a more liberal employment of the clinical facilities that are at hand.

Examination of Unstained Blood.—Dr. G. Lenox Curtis, of New York, described certain unusual conditions that may be recognized in unstained blood when examined microscopically. Fibrin in various forms in-

dicating rheumatism, and gouty tendencies may be seen. Tuberculous material and indigestion corpuscles may also be recognized. Dr. Curtis is able to differentiate many forms of disease in this way and by a process of ozonation of the patients, to treat them successfully. He exhibited microphotographs of the various appearances described and demonstrated the process of ozonation by means of currents of high potential.

In discussing Dr. Curtis' paper, Dr. Weber said that the photographs presented showed only one thing, viz., extreme lack of knowledge of the technic of blood examinations. The pathological appearances shown might readily be produced from the blood of any individual in the room if only enough inattention to their ordinary precautions of blood work were exercised. Much can be learned from unstained blood, and the late Prof. Virchow never studied blood in any other way, yet made important discoveries, but Dr. Curtis' discoveries are of artefact appearance.

The Boy's Venereal Peril.—Dr. Ferd C. Valentine, of New York, entered a plea that the growing boy should be taught the true significance of venereal diseases, as physicians now know it. This should be given at two periods, first, at puberty, either by the father or the family physician, and later, when the boy first goes out of the family life to be more or less independent. Physicians must realize their duty in this matter, for medical knowledge has grown while the popular ideas as to the comparative harmlessness of venereal diseases have remained unchanged.

Dr. Jas. J. Walsh, of New York, said that it was undoubtedly the duty of universities to furnish this kind of information to their students. Young men by attendance at universities are brought into all the dangers of city life. They should be given the safeguards of a knowledge of the physical evils of venereal diseases. Faculties that do not make some provision for this are neglecting a serious duty. The medical members of university faculties should bring all their influence to bear so as to insure this needed teaching. At the university of Berlin a course on the significance of venereal disease, open to all the students, is supported out of the German Emperor's private purse and is very numerously attended. Our objections to such a course are founded on pusillanimous prudery.

Dr. Robbins, of Michigan, said that there is danger of teaching young boys too much, so that their curiosity is aroused. At the college age, however, it is an injustice to allow boys to go without this precious knowledge.

Dr. DeLancey Rochester, of Buffalo, said that his information might be imparted during the high-school period if teachers of physiology could be made to teach the subject properly. There is in it room for much good more than in the present method of avoiding the evils of tobacco and alcohol.

Continued Fever Neither Malarial Nor Typhoid.—Dr. T. J. Happell, of Trenton, Tenn., said that there is undoubtedly a third, continued fever apart from malaria and typhoid fever which comes frequently under the observation of Southern physicians. The fever is uninfluenced by quinine, even when carried to the extent of mild cinchonism maintained for some days. Remissions amounting to intermissions occur on the last days. The attack lasts from four to six weeks. Cold stages occur day after day. There is no feeling of fever, but the thermometer shows its existence. The pulse corresponds to the fever more than in typhoid fever. There is no tendency to diarrhea, but rather to constipation. The tongue is not typhoid, and mental and nervous symptoms are very infrequent.

Southern Fevers.—Dr. Wm. Kraus, of Memphis, Tenn., said that as the result of autopsies made in anom-

alous cases of fever it had become clear to him that there was no true atypical form of fever in the South, that is, none that might not be explained as due to typhoid or malaria or paratyphoid or to some form of intestinal toxemia. In one case of diagnosed pernicious malaria the autopsy showed extensive congestions pointing to sunstroke and the history of the case sustained this conclusion while there were no plasmodia in the blood. In another case suspicion of sunstroke led to the decision not to give quinine, which is always dangerous in such cases. In one case of anomalous fever, the patient proved to be having the paroxysms of malaria during the night when they passed unnoticed.

Mountain Fever and Typhoid.—Dr. J. N. Hall, of Denver, Colo., said that mountain fever is gradually becoming rarer as a diagnosis according as more careful observations of typhoid are made. Typhoid fever in mountainous regions presents some peculiarities, but in most ways it does not differ materially from the same disease at lower altitudes. Dr. Hall's experience with regard to pregnancy during typhoid is not so unfortunate as that generally reported. In his experience neither mother nor child needs necessarily be placed in great danger of life. In recent cases with rational therapeutics both mother and child have survived.

Typhoid Fever and Fasting.—Dr. R. M. Harbin, of Rome, Ga., reported the clinical observations of 90 cases of typhoid fever with but four deaths, the principal therapeutic measure insisted on being fasting. Severe ethnic cases of typhoid fever have their active symptoms which are apt to be so exhausting that the patient is relieved sooner and better by absolute abstinence from food than any other method of treatment. Gelatin prevents too rapid emaciation and seems to be soothing to the bowels. Where hemorrhage threatens or has actually occurred, gelatin should be freely used. When diarrhea is a prominent feature of the case fasting must be insisted upon. When vomiting is severe, especially at the beginning of an attack, this is also the most effective remedy. Under a fasting régime the course of all cases of typhoid is shorter, and many so-called abortive methods of treatment owe whatever virtue they possess to the absence of irritation of the intestinal lesion by fecal matter.

In discussion, Dr. Thomas B. Fletcher, of Baltimore, said that at times the treatment of continued fever by coal-tar products gave rise to sweating periods, chills and a very irregular temperature chart that might lead the observer astray as to the character of the disease. Some times these remedies are taken without the advice of physicians at the beginning of the case, especially, and produce anomalous appearances.

Dr. James Tyson, of Philadelphia, said that while anomalous cases of continued fever frequently came under his observation, careful investigation always brought them under one of the ordinary heads, typhoid fever, malaria, paratyphoid, or some enteric condition, producing fever. It is the tendency of clinical experience to lessen the number of types of disease. Dr. Tyson's experience with pregnancy complicated by typhoid fever has been better than the usual text-book declarations. Three patients at the University Hospital have been carried successfully through their typhoid fever without the loss of the fetuses. One healthy child has been born, and the outlook for carriage to term in the other patients is good, since their fever is now over.

Dr. I. L. Van Zant, of Fort Worth, Texas, said that after forty years of experience he feels that the so-called slow fever of the South is only a mild type of typhoid fever. A slow pulse with a high

temperature is almost pathognomonic of typhoid fever. Often anomalous symptoms in typhoid fever are due to disturbances of the digestive tract, and when a foul breath indicates this, Dr. Van Zant has found that acetozone will correct the symptoms.

Dr. Witherspoon, of Nashville, Tenn., said that there is certainly some fever different from malaria or typhoid in the Southern States. Three years ago he suggested for this type the name toxenteric fever. It does not occur at any special season, nor affect any age by preference, it does not protect against second attacks. The fever is very irregular. The high point is not always in the afternoon. The temperature chart reminds one of a septic condition, yet the affection is not very serious. The tenderness is apt to be in the left iliac fossa rather than the right. Constipation rather than diarrhea is characteristic of the disease; patients retain their appetites. Instead of lethargy, irritability is the rule. Patients are very troublesome, anxious and restless. Herpes labialis, unusual in typhoid, is very common. The tongue is quite different from that of typhoid. There are no rose spots. The affection may be paratyphoid fever, but it certainly is not true typhoid.

Dr. Mason, of the U. S. Army, said that in all cases carefully investigated in the army service, the plasmodium or Widal reaction was ultimately found. Two or three cases of paracolon fever were recognized, and in one case the disease proved to be Malta fever. No new type of fever is needed to explain the affection.

SECOND DAY—MAY 6TH.

Heart Weakness and Dilatation from Nutritional Causes.—Dr. G. W. McCaskey, of Fort Wayne, Ind., called attention to the low myocarditis that may occur as a consequence of lowered nutrition. Very little may be found microscopically beyond slight interstitial or fatty or pigmentary degeneration, yet the action of the heart muscles is distinctly interfered with. The rise of blood-pressure consequent on even slight exercise may cause such a heart to labor and even initiate dilatation of the heart cavities. All the persistent anemias cause such a dilatation and chronic gastro-intestinal disease partly from lowering of nutrition and partly from spasm of the arterioles may cause tendencies to cardiac dilatation. The indications are not for direct treatment of the heart by cardiac tonics, such as digitalis, but by improvement in the general condition to cause favorable alteration in the metabolism of the heart muscles.

Limitation of Non-surgical Treatment of Intestinal Obstruction.—Dr. Joseph R. Eastman, of Indianapolis, said that much more harm is done by waiting too long before operation, when there are threatening symptoms of intestinal obstruction than by subjecting the patients to the risk of operation. The exact diagnosis is often impossible until the abdomen is actually opened. Exploratory laparotomy should be undertaken much more freely than is at present the case. Morphine only serves to mask the symptoms and deceive the physician while bringing the patient and friends into a false sense of security. The danger is in delay rather than in operation. Whenever symptoms are sudden of development there should be no hesitation in securing, as soon as possible, the surgeon. When the symptoms are more gradual, treatment by means of large injections may be continued for some time until assurance is obtained that the condition is not really one of fecal impaction, which so often simulates true obstruction with strangulation.

Strongyloides Intestinalis in the United States.

Dr. M. L. Price, of Baltimore, detailed the history of this filarial worm, which was first described by Normand in 1867. In recent years it has come to be associated as a causative agent with the special dysenteric disease known on the China coast and also in the Philippines and in Japan as Cochlin China diarrhea. Like the uncinaria or *Anchylostoma duodenale*, this was first observed in Europe in the stools of laborers in the St. Gothard tunnel. Since then it has been found in many countries, especially in the tropics. The first cases observed in the United States were in the service of Dr. Wm. S. Thayer, of Baltimore, and he studied the life habits of the worm. Dr. Price has recently had a case of disease under observation, and has been able to add some details to our knowledge of the subject. His patient has suffered from chronic diarrhea for five months often having ten to twelve motions per day. There had been periods of relief followed by exacerbations that were most discouraging. The case would have been considered some years ago as a chronic diarrhea of persistent type but without any suspicion of a parasite as the cause.

Life History of the Parasite.—The worm is about three-tenths of a millimeter in length, and four-hundredths in breadth. It is covered by a clear zone of quasi-gelatinous material, all the protoplasm within this envelope being granular in character. When the worm dies the granular appearance becomes exaggerated, and even the clear envelope shows granules. The worm is constantly in motion. This motion seems to be part of its vital activity, and makes up for the lack of the cardiac vascular system of other animals, there being no such mechanism in the worm. The parasite exists in two forms, the parthogenetic mother worm and the rhabditiform or walking-stick-like embryos. Infection with the worm causes a dysenteric affection, which may be complicated by attacks of severe diarrhea with collapse and nausea resembling cholera. Not long after infection takes place the patient begins to suffer from anemia, which becomes more and more pronounced, and is out of proportion to the disturbance of nutrition. It has been attributed as in the case of the uncinaria to some poison secreted or excreted by the parasite which is absorbed into the system. Strongyloides are often associated with uncinaria so that some of the symptoms attributed to it may really be due to its companion parasite.

Frequency and Treatment.—Dr. Price said that undoubtedly this parasite is much more frequent in this country than has been thought. Besides Dr. Thayer's cases Dr. Stiles, of Washington, D. C., has found the parasite unexpectedly in five cases where its presence was utterly unsuspected. As to treatment, nothing definite has as yet been decided upon. On theoretic grounds, because of its action on uncinaria, thymol has been suggested. Dr. Price administered large doses of thymol, about 100 grains, in his case, and numbers of embryos came away though the patient had been fasting for a day, and there were none of them in the stools before. These embryos had somewhat lost their motility and were beginning to shrivel from the action of the thymol. A week later thymol was once more given. For a time the patient improved, but later suffered a severe relapse.

Distribution of Cochlin China Parasite.—Dr. Chas. W. Stiles, of Washington, D. C., said that undoubtedly the parasite of Cochlin China diarrhea is widely distributed in this country. Besides his five cases three have been found in California, and others along

the Gulf States. Rhabditiform embryos are not uncommon in water and vinegar. These have no connection with strongyloides, yet may be found in the stools. The pin worms, too, have ova viviparous embryos that may be taken for strongyloides. The diagnosis then must not be made from one or two chance small filiform worms in the stools. The parasite may be expected to occur in our southeastern and Gulf States, but as it is very common in the Philippines, and as soldiers will now be returning from there to all parts of the country, it may turn up almost anywhere.

Dr. Allen J. Smith, of Galveston, Texas, said that the strongyloides are surely very common in our lower tier of States. They may be found as at Galveston in occasional patients without diarrhea or anemia or other symptoms.

Dr. A. P. Ohlmacher, of the Ohio State Insane Asylum, reported the finding of this parasite in an epileptic who had been closely confined for several years, and who had suffered from diarrhea for only three months before his death.

(To be Continued.)

SECTION ON SURGERY AND ANATOMY.

FIRST DAY—MAY 5TH.

Exploratory Operations.—Dr. James E. Moore, of Minneapolis, in his address said that it was difficult for one of the older men to realize what changes would come in the near future as a result of new and improved methods of medical education. The young surgeon of to-day and of the future has of necessity a more difficult duty to perform because he stands face to face with facts which to his predecessors meant relatively little. The pelvis lent itself so favorably to bimanual investigation because of the numerous channels leading therefrom that it might almost be considered a superficial portion of the body, and in consequence had been most thoroughly worked over. The territory of the upper abdomen, however, in which were organs of even greater vital worth was as yet a relatively unknown field. There were few methods of microscopic or chemical types which lent themselves to the definite establishment or early diagnoses of these parts and the positive proof of such diagnosis often meant life or death to the patient. In the last five years in which had occurred an awakening in the surgery of the pancreas and of the gall-bladder the ethics of exploratory incisions into this region had occupied a prominent place in the thoughts of all abdominal surgeons. He concluded that without exploration diagnosis was impossible, with exploration made by a moral and highly trained man all things were possible.

Suppression of Urine.—Dr. H. J. Whitacre, of Cincinnati, was called to the bedside of a young woman who had induced abortion upon herself, by the use of ergot and the sound. She had a temperature of 104° F., which was relieved by an intra-uterine douche. After using all known methods of treatment he split the capsule of each kidney. The organ looked like the congested face of an asphyxiated fetus. On sectioning the capsule the parenchyma popped through the incision, indicating tremendous pressure from venous congestion. The patient passed urine one hour after operation and her recovery was almost immediate. He believed that this type of suppression was of vasomotor origin and that the woman would certainly have died in the absence of surgical intervention.

Fat Necrosis of the Kidney.—Dr. J. R. Guthrie, of Dubuque, Iowa, said that fat might be formed from

albuminoid matter as well as in other ways physiologically, but that the cause of fat necrosis in any organ and particularly in the kidneys were not understood. Whether it was due to the action of certain bacteria or from the presence of peculiar physical limitations, certain it was that occasionally one came across cases which seemed to show that the latter factors alone might suffice to produce absolute parenchymatous destruction. These changes consisted in diminished blood supply due either to a narrowing of the vessel by deposit, or by torsion, to a diminished supply of oxygen, to persistent venous congestion. Profoundly displaced kidneys present these physical anomalies and it is not improbable that a number of the cases of liquefaction of the parenchyma of the organ may be attributed directly to physical causes.

Surgical Treatment of Nephritis.—Dr. A. H. Ferguson, of Chicago, said that he published the history of two cases of interstitial nephritis, which had been confirmed as such by Klebs more than a month before the appearance of Dr. Edebohls' paper. He, therefore, claimed priority for the operation.

Dr. A. D. Bevan, of Chicago, opened the discussion. He said that too little attention had been given to the intricate problem of aneuria. He divided it into obstructive, reflex and nephritic. The first is always surgical, the second may be. He considered decapsulation as utterly useless, but held that great good might be done by a generous nephrotomy.

Dr. Jepson, of Iowa, said that Edebohls was not the originator of the decapsulation technic. There could be no doubt that the operation was valueless in tubular nephritis. In the interstitial form it might do good.

Dr. A. McLaren, of St. Paul, said that the relief obtained in certain cases of nephralgia was due to the splitting of the capsule, not to its separation.

Dr. R. Guiteras, of New York, believed that this operation for chronic Bright's disease had not yet been performed often enough for any one to express positive opinions. Johnson, of California, had shown there to be no increase in the blood supply of normal kidneys which had been decorticated.

Dr. Ferguson, in closing, said that no important deduction could be made from observations upon the kidneys of dogs because these, being normal, did not need the blood supply which was consequently withheld.

Indications for Cholecystectomy.—Dr. B. B. Davis, of Omaha, said that there were two main reasons for preferring this operation to cholecystostomy. In 20 per cent. the relief is only partial, in about 25 per cent. fistulae persist for a long period. Less than one per cent. of cholecystectomy cases continue to have pain and fistulae are unknown. There were a few cases in which the more radical operation was contraindicated; these were chiefly in association with profound sepsis.

Operations on the Gall-Bladder.—Dr. F. A. Duns-moor, of Minneapolis, said that there would be no occasion to use any but very simple methods in dealing with all the organs of this region if only an early diagnosis could be made. This was and would continue to be impossible save by an explanatory incision.

Dr. W. J. Mayo, of Rochester, Minn., in discussing these papers, said that much judgment must be exercised to determine whether to drain or to remove the gall-bladder. He had formulated the rule to ablate the organ whenever a stone occupied its pelvis or the cystic duct. These cases could be closed without drainage because by so doing there was no danger of inducing a sudden back pressure of bile on the liver. This was the most frequent cause of death. In all these cases there should be free and easy passage for the bile.

Dr. J. B. Murphy, of Chicago, said that overlooked stones and flexions of the cystic duct were the two

causes which led to a return of symptoms after cholecystectomy. Removal was not so safe as drainage.

Dr. Oschner, of Chicago, spoke of the difficulty of making positive diagnoses in all but the few cases of cholelithiasis which present classic symptoms. Gastritis is too often the sole symptom presenting. He favored cholecystectomy, but drainage was in many cases safer.

SECOND DAY—MAY 6TH.

Surgery of Gastric Ulcer.—Dr. Van Buren Knott, of Sioux City, Iowa, said that it had not until very recently been recognized that a great many of the obstinate dyspepsias and cases of intractable gastric irritability were due to the formation of adhesions between the stomach and surrounding viscera. Since gastric ulcer is in about 80 per cent. of cases situated near the pylorus, fully as great a proportion of adhesions exists in that neighborhood. The symptoms of this condition are essentially vague. They may, however, rarely become so serious as to produce severe pain or even endanger life. These adhesions interfere with the normal downward displacement of the stomach which should take place after eating. They further limit the degree of peristalsis, thus not alone producing pain from traction but producing direct mechanical interference with digestion. He had attempted to differentiate the symptoms which arise from adhesions situated in different parts of the stomach wall, but later concluded that the operator might be fortunate if he were able definitely to conclude that adhesion existed. The most prominent symptoms being a fixed point of tenderness, an irregularity of gastric outline when inflated, and marked pain from the knee-chest position. Those adhesions, which are frequently encountered between the abdominal wall and the anterior portion of the stomach, when broad and dense should be left alone, a simple gastro-enterostomy being indicated.

Pyloric Obstruction.—Dr. H. D. Niles, of Salt Lake City, Utah, said that ulcer, inflammatory adhesions or malignancy produced 95 per cent. of pyloric obstructions. In the benign conditions three-quarters of the sufferings are due to the dilation and consequent diseased condition of the stomach mucous membrane resulting from the closure of the pylorus. A great deal is to be expected in the near future from timely operations, which, because done early, can be of a radical kind. Adhesions unquestionably produce the physical conditions of malnutrition best calculated to result in ulceration, and an early recognition of their presence will not alone prevent the formation of ulcers, but avert the appalling series of well-known sequelæ. He said that the diagnosis could be reached only through the early employment of exploratory incision and concluded that because of the relative safety of operations performed both before the patient had lost his strength and prior to the establishment of grave pathological lesions in the stomach, the near future would produce a technic so simple, so curative and so safe that a vast number of lives would be saved.

Stomach Surgery.—Dr. A. J. Ochsner, of Chicago, said that we were on the verge of simplifying gastric surgery to an astonishing degree, because we will shortly be able to operate upon the cause rather than the sequelæ, as is now the case. Gastric ulcer is the fountain of practically all surgical diseases of the stomach, of hemorrhage, of perforation, of peritonitis, of carcinoma, and of many more. The reason that it is safe to reach this conclusion is because of the tremendous improvement in operative

technic, and because enough cases are now under observation to enable us to speak with assurance of the permanent good results of conservative gastric surgery. Not the least important has been the discovery by Mayo that the vicious cycle so fraught with danger had been entirely annulled by the simple method of using the most dependent part of the stomach for making the anastomosis. Pyloroplasty has not as yet been satisfactory, because it fails entirely to remove the obstruction and the dilated walls of the stomach are unable to drive the fluids uphill, and consequently the condition which the surgeon has endeavored to relieve is only mitigated. Gastro-enterostomy properly done in cases unable to stand the better operation of partial gastric resection will be the operations of the future. Protoplastectomy will remain always a rare, because unnecessary operation. The after-treatment of gastric cases consists in rectal feeding for two weeks, in the use of predigested food by mouth after the fourth day, in gastric lavage, only a half pint of water being used.

In opening the discussion Dr. Andrews, of Chicago, asked what were the indications for operation in these cases. Simply stomach trouble in the anemic hysterical patient, who must be sent to one who will drain the foul stink-pot of a stomach by gastro-enterostomy. This is the panacea, not the ovary, the hemorrhoid or the appendix. Dr. Mayo, of Rochester, Minn., said that to-day the surgery of gastric ulcer is unfortunately that of its sequelæ rather than that of the primary lesion. In what way can we take steps to educate ourselves to the treatment of gastric ulcer before it has gone on to perforation, to hemorrhage and to the formation of malignant growths. To cut them out is most difficult because of the annoying ease with which they escape the most careful search. Fortunately most gastric ulcers lie to the right of the point at which we should do gastro-enterostomy, therefore this relatively simple operation gives relief and is indicated in the majority of cases. This is true incidentally of the 12 per cent. of so-called gastric ulcers which are really situated in the duodenum, and which naturally could never be found in the stomach by any amount of search. Of course the ideal operation is extirpation, and this safely may be a partial gastrectomy because of the fortunate distribution of lymphatics in the stomach, those draining the pylorus not passing to the dome of the stomach. This may accordingly be left, while the entire lesser curvature must always be cut away.

Dr. Rodman, of Philadelphia, said that excision of the ulcer would come when the technic became more perfect. The statement that multiplicity of ulcers contraindicates partial gastrotomy is not of great weight. He had not yet succeeded in doing away entirely with the vicious cycle and believed that Mayo's technic would not in all cases prevent it. Dr. Ochsner said that when the extremist got the general practitioner educated to the point of understanding, that the bulk of surgical ills took origin in gastric ulcer and that this condition was curable by early and safe operation, there would be very little work for the gastric surgeon to do.

Circular Enterorrhaphy.—Dr. O. B. Campbell, of St. Joseph, Mo., described his new technic, as follows: A knife is run around the gut and through the mesentery, cutting down to the submucosa. The cuff of the external coat is then turned back, the mucosa is next cut out and the ends sutured together. The cuff is then rolled back over these sutures and sutured to the serous surface of the bowel.

He reported upward of 75 cases on dogs with one death from failure of the technic. The pathological reports were most gratifying and surely showed the union to be complete.

In discussing these papers, Dr. A. F. Jonas, of Omaha, cited the following points as paramount for successful intestinal work. The approximation of the mesentery segment must be absolute, no knots should exist outside the lumen. The mend must be air and water-tight. The Connell suture fulfills these requirements better than any other.

Multiple Osteomyelitis.—Dr. J. T. Bottomley, of Boston, stated that this condition is one of extremest rarity, occurring almost invariably in children, and due to invasion by the staphylococcus. He cited a case of an adult, forty-three years old, in which practically all the bones of the extremities and some of ribs underwent absolute destruction. The patient was operated upon again and again, but finally succumbed to the advancement of the pulmonary focus, which had been the source of supply for the different infections.

Osteomyelitis.—Dr. E. H. Nichols, of Boston, said that the process was usually checked by the epiphyseal line. Bone is reformed from the periosteum as well as from the endosteum. The important points in his paper were the recommendations that the medulla be left intact, that the operations be divided into three groups, that in most cases the larger part or the whole necrotic shafts should be removed.

Dr. Willard, of Philadelphia, in opening the discussion, said that every case of acute osteomyelitis needed as prompt care as appendicitis. It was not so much treatment, but the decision to treat which needed to be taught.

Dr. J. B. Murphy, of Chicago, said that every case of acute osteomyelitis should be recognized and operated upon within forty-eight hours. It was to be differentiated from acute rheumatism by the temperature, by the tenderness of bone to prolong deep pressure, by the absence of effusion into the joint, and by the lack of swelling. The source of infection was always close to the epiphyseal line, and it usually bursts through to become subperiosteal at the end of forty-eight hours. After that the surgeon is only secondary value to the patient.

Dr. Nichols, in closing, was unable to agree with Dr. Murphy that the diagnosis should always be made. He felt that there are unquestioned cases associated with profound toxemia, which are almost impossible to differentiate from typhoid fever.

The Treatment of Vascular Tumors by the Injection of Boiling Water.—Dr. J. A. Wyeth, of New York, has found water preferable to wax or alcohol, and that it was indicated in the three types of vascular growths, but found its best use in those of the cavernous venous type. He has, however, successfully used it in a dreadful case of cirroid aneurism of the scalp. He showed the syringes with which he did the work.

Umbilical Hernia.—Dr. Wm. J. Mayo, of Rochester, Minn., reported 35 cases of this condition with but one relapse after operation. He said that from now on he should make the flaps from above downward because in that position the more the patient strained the tighter did the mend become.

Dr. Ochsner said that it was surprising that an operation which yielded as high a percentage of cures in this hitherto practicably incurable malady as did Bassini's operation, should as yet have been ignored by the writers of text-books. It succeeds because it produces one-tenth the trauma of other

methods and restores the full strength of the body wall.

Dr. Murphy said that the reason the old operation killed so many people, was that the sudden increase in tension interfered with the action of the heart and lungs, and resulted in pulmonary edema.

Enterostomy for Peritonitis.—Dr. F. B. Lund, of Boston, said that paralytic distention of the bowel is a complex phenomenon caused by a variety of conditions. He stated that the technic was indicated only in cases in extremis, whether the bowel was distended by reason of paralysis or of obstruction low down. It was a life-giving emergency operation to be performed under cocaine.

Dr. Martin B. Tinker, of Philadelphia, in discussing this paper said that at the Johns Hopkins Hospital the procedure of ileostomy had for some time been looked upon favorably. He was certain that in a small percentage of cases it had saved life. The only contraindication to its employment was the pain due to the excoriations about the wound. These were conveniently treated by keeping the patient permanently in a warm bath. All their fistulae had healed without secondary operation.

(To be Continued.)

SECTION ON OBSTETRICS AND GYNECOLOGY.

FIRST DAY—MAY 5TH.

President's Address.—Dr. A. Palmer Dudley, of New York, made a most happy speech of welcome and thanks to the members for having elected him as their President. The subject of his address was a plea for a more conservative method of operations upon the diseased female organs. He showed most conclusively that ever since he first began to operate with this in view, in 1887, that his efforts have been followed by most gratifying and successful results. Altogether he has operated upon 269 of such women, 45 of whom have become pregnant. He reported that there were in the literature more than 2,000 cases operated upon by eminent men all over the United States, and that he had letters from these men which corroborated all the claims that he had made for conservatism. The neurologists of to-day were reaping a rich harvest as a result of the almost criminal eagerness with which the female organs had been removed by surgeons twenty-five years ago. Premature menopause with its concomitant serious and distressing symptoms, was appalling in its great numbers as a result of these honest, but mistaken operators. He showed that over ten per cent. of the women upon whom he had operated conservatively had borne children.

Appendicitis from the Standpoint of the Gynecologist.—Dr. H. P. Newman, of Chicago, remarked that in the generality of cases of appendicitis one experienced little or no trouble in making a diagnosis, but oftentimes there came a case where it was hard to differentiate between appendicitis and pyosalpinx. Our forefathers were wont to call appendicitis by a variety of names, such as perityphilitis, gastric fever, congestion of the bowels and what not. To-day we are more likely to confound pelvic trouble, such as pyosalpinx, oophoritis, etc., with appendicitis. The vital symptoms in such conditions are relative to peritonitis. Peritonitis produced in the course of an appendicitis is always fatal; whereas a peritonitis in the majority of cases is not fatal if produced in the course of a pyosalpinx. In every case where the abdomen is opened for pelvic trouble, it is just as well that the operator explores and examines the whole abdomen. In every instance the appendix should be most carefully examined, and its re-

removal depends both upon the gynecologist and the condition of his patient. If the appendix contains any sort of a concretion or is adherent to the ovary, or if there is a catarrhal condition present, it should most certainly be removed.

Any localized peritonitis might cause intestinal obstruction. Although the operator found that the appendix was healthy, but adherent to any of the pelvic organs, it would be his duty to remove it. The operation of choice for the author in appendectomy has been the invaginating one.

Dr. E. Reynolds, of Boston, said that it was not always easy to explain the symptoms by the examination of the patient. He did not advise indiscriminate operation, but thought that it was just as well to wait until the symptoms were of such a degree that operation was absolutely necessary to relieve the distress of the patient. Whenever there was a localized tenderness on the right side with flatus and mucus in the dejector, a diagnosis of chronic condition of some sort in the appendix was assured. The time has passed when we can afford to hesitate in the removal of the appendix, although we of to-day remove more appendices than our fathers did, our sons will undoubtedly outstrip us in this worthy cause.

Dr. E. Ricketts, of Cincinnati, thought that it was not always easy to differentiate between appendicitis and salpingitis in such cases. Cases where the appendix is attached to the tube and ovary do not necessarily produce attacks which were due to appendicitis.

Dr. P. Michinard, of New Orleans, considered that the chief point of interest to the gynecologist was not the operation, or the method of operation, but how one might make a differential diagnosis between appendicitis and salpingitis on the right side.

Dr. J. H. Carstens, of Detroit, remarked that in appendicitis the uterus was movable. One could not get pain over McBurney's point in salpingitis. Very often the cecum was in the pelvis and there one might get an appendicitis of the pelvic variety and no pain over McBurney's point. He made it a rule to remove the appendix whenever he thought its condition warranted it, provided the patient's condition was such as would permit the increase of time produced by an appendectomy.

Dr. Newman, in closing, said that the object of his paper was not to bring out the various methods of operation, but to make the operator more keen in the observation of the appendix while performing pelvic operations; that it should be the duty of every operator to use his own judgment as to whether an appendix should be removed and not to have any hard and fixed rule concerning the removal of this organ.

Gastric Ulcer.—Dr. A. H. Cordier, of Kansas City, in reading this paper, said that if there exists in the stomach an ulcer, one should be very careful to put the organ at rest, just as he would in carrying out a line of treatment in inflammation of an organ or member in any part of the body. Chronic ulcers he found more frequently upon the posterior wall of the stomach along the lesser curvature. This he realized was in variance with statistics on this subject. Fortunately for patients, ulcers on the posterior wall were less liable to bring them to autopsy because the stomach is more likely to become adherent in this region to the organs near it and in case of perforation the contents of the stomach do not escape into the abdominal cavity, but are walled off from it. Ulcers of the anterior wall perforate into the abdominal cavity into which the stomach empties its contents and death results. Such being the case, it results in statistics showing that ulcers more frequently occur on the anterior wall. Healing of gastric ulcers often produce constrictions in the organ.

When the ulcer attacks a large blood-vessel the

hemorrhage resulting causes death. These cases are not usually operable, but die before the surgeon can intervene. Ulcers of the pylorus are liable to cause obstruction and consequent dilatation. Adhesions to the liver produced dilatation of the stomach. Gastric ulcers were not found to be most common in young girls as statistics have shown in the past. During menstruation all signs and symptoms of ulcer of the stomach, pain, tenderness, bleeding, and vomiting are exaggerated. Vomiting is not preceded by nausea, but is without effort and occurs about fifteen minutes after the patient has taken in food. It is an alarming fact that quite a little over ten per cent. of cancers of the stomach, especially the pylorus, may be traced to the existence of a former benign ulcer. The author reported a case where a healed ulcer had produced stenosis of the pylorus. He had used in all of his cases the Murphy button and considered it harmless, inasmuch as in the case reported the button had fallen back into the stomach and remained there seven years without producing any symptoms whatsoever. Although medical treatment might in fifty per cent. of the cases and more give good results, there remain those cases in which it was not satisfactory. Then it was that he deemed it necessary to use operative measures for the cure of this condition. The operation that he advised was gastro-enterostomy.

Dr. J. H. Carstens, of Detroit, in discussing this paper, remarked that cases of pyloric obstruction of any cause is most satisfactorily cured by operation. He did not use the Murphy button, but the McGraw elastic ligature.

Dr. J. G. Clark, of Philadelphia, considered that there were but two questions of importance in gastric ulcer, first, how long should the case be treated medically? In his opinion this should be entirely left to the judgment of the expert medical man. Second, how can we find the ulcer? If the ulcer was a posterior one, it could be easily made out by an exploratory gastrotomy. Having located the ulcer it was suggested that the operation might be performed through the gastric wound, and the suturing of the ulcer would be performed within the stomach cavity.

Dr. Cordier, in closing the discussion, remarked that he did not deem it advisable to operate during an alarming hemorrhage as the patient would most certainly die upon the table. The proper thing to do was to operate by any method which would give the result in the shortest possible time, hence he employed the Murphy button. The chief object in doing the operation that he advised was to produce drainage in the stomach by gravity alone, therefore he made his anastomosis on the anterior wall.

SECOND DAY—MAY 6TH.

Infected Gall-bladder Contents.—Dr. E. Ricketts, of Cincinnati, said cholecystotomy was the best operation that could be employed in this condition until free drainage was obtained. This was a primary law in all methods and surgical operations. Three-fourths of the cases of this variety were found among women. The number of stones present did not add to the gravity of the case. The chief bacteria were the typhoid and the colon bacilli. The gall-bladder can be infected without involvement of the duct, which might be patent, but the patient would die. Rupture occurred and a diagnosis of the case is made by the passage of gall-stone through the duct, but the flexion of the bladder upon the duct held the bile within the bladder. The bladder might form a fistulous connection with the duodenum. Jaundice was always a serious complication. Biliary fistulae were not so common as the profession had been led to suppose. It was better to incise the duodenum over the diverticulum, and

to push the stone back into the gall-bladder when you could not push it forward into the duodenum. The operation of cholecystotomy could be done under a local anesthetic. Cases which recovered by means of medication alone were very rare.

Dr. S. H. Dunning, of Indianapolis, in discussing this paper, said that the most important thing in these cases was to know when to operate and how much should be done in cases of empyema associated with stone. Stone impacted in the duct gave intermittent jaundice. In many instances it is better to drain the bladder and let the stone alone. It was not often necessary to open the duodenum, but better to open the common duct and drain it. The mortality was 75 to 80 per cent.

Dr. A. P. Dudley, of New York, said that where infection was present in the gall-bladder aspiration was indicated, and if the bladder contained pus it should be washed out with a solution of formaldehyde 1 to 2,000. He advocated drainage. As there was no contractile power in the blood-vessels, one was very likely to get hemorrhage.

Dr. Ricketts, in closing, said that it was not the ordinary operation that worried one, but what was to be done in an emergency. No emergency would arise if the family doctor had promptly recognized the symptoms which had been present for some time. It was in these patients that abscess of the liver occurs, and these were most difficult to deal with.

Better Methods for Repair of the Perineal Structures.—Dr. H. O. Marcy, of Boston, said that for many years there had been no general acceptance of any one method of procedure in these cases. Injuries of the perineum vary from rupture of the hymen to complete tear through the rectum. In operating successfully the sphincter must be dilated and the septum made tense by the fingers in the rectum until the beginning of the incision. The posterior one-third of the vagina is separated over the rectocele and not simply dissected off. The vulvar opening was restored by this operation, and even the hymen might be reproduced if necessary. Urine should be drawn off the first day.

Dr. Graham, of Indianapolis, presented a most interesting modification of the Emmett operation, which he felt most perfectly restored the relations of the lacerated perineum.

Dr. Gibbons, of Scranton, said that Dr. Marcy's operation was usually sufficient to cure all cases.

Dr. Marcy said, in closing, that he had found his operations to be perfectly satisfactory in all cases, and that the patient that had been operated upon thirty years ago, had borne children, and a short while ago he had found her perineum to be intact.

The Repair of Cystocele.—Dr. E. Reynolds, of Boston, said all operations were not satisfactory, in the writer's mind, for the cure of this condition, because they did not presuppose that this was a condition comparable to a hernia in any other part of the body, and as such it should be treated. The useless sack should be excised and the edges brought together. Those older operations that obtained, the lateral and longitudinal increase of tissue would do if they were deepened. The writer described his operation in detail and said that it would cure any case of that variety. Dr. Reynolds, in closing, said that there was a transverse narrowing of the vaginal wall while the anterior wall was markedly elongated. This condition approached nearest of all to nature.

Lacerations of the Cervix.—Dr. D. H. Craigs, of Boston, said that two years were a minimum time to observe the results of this sort of operation. The opera-

tion should only be resorted to after all palliative treatment had been tried. Eighty-nine of the 100 cases with which he had communicated after operation had been improved, and more than 50 of them had been cured. The operation did not tend to produce sterility. Forty-nine of these cases had become pregnant and all but eight had gone on to full term. These had aborted either artificially or naturally. Relaceration was not a contraindication to the operation. Women past thirty-five years are more permanently benefited than others as they did not work so hard and were less likely to bear children.

Dr. Marcy, of Boston, believed that the reason of failure in these cases was that the nervous symptoms had not been cured and that the proper medical treatment had not been employed previous to operation. The operation which favored failure was chronic metritis. Dr. Holmes, of Chicago, said that every woman when she gave birth to a child, had some sort of a laceration of her cervix, but this only became pathological when symptoms were set up. Symptoms were those resulting from lacerations in general.

Dr. Craig, in closing, said that he did not believe cervixes should be operated upon indiscriminately, but if symptoms were severe and local treatment did not relieve them operation was indicated.

The Hygiene of Young Girls.—Dr. J. H. Carstens, of Detroit, remarked that neurasthenia was a condition which might be transmitted from mother to daughter and fostered in the child by the mother to that degree which would make the child a genital invalid for life. This might be avoided in the majority of instances by the proper conduct of the girl's life during the period of puberty, especial care being taken to protect the child from unhealthy surroundings, occupation and improper method of eating and dressing. The mother should protect her child against the frivolous occupations of society. The training of the young girl was the most difficult problem before the gynecologist. Sterility was often the result of neglect. The laity in general were opposed to the examination of young women. The young had an equal right with the old to be cured. Almost all female troubles can be cured if not prevented by the early treatment of them. Neglect might cause destruction of the tubes and ovaries. Rectal examination was the method of choice except in rare instances.

Dr. Bonifield, of Cincinnati, said that young women should always be examined under an anesthetic, but that the operator should be prepared to do any operation which might be found to be required during course of the examination.

Dr. Carsten, in closing, said that it was best to avoid examining young women as much as possible less they be too deeply imbued with the fact that they possess those organs of which they should remain in ignorance as long as possible.

Dr. Lawrence remarked that it was most important for the gynecologist to realize that cystitis in young women was rare and when present was associated with pelvic disease.

Fixation of the Prolapsed Kidney.—In this paper Dr. A. H. Golet, of New York, the author, remarked that belts and corsets were totally inadequate if the kidney had descended below the costal margin. When the colon became distended it dragged the kidney down and belts did no good. He advised an operation by means of which the kidney was drawn up under the edge of the ribs and retained there by sutures for three weeks, at the end of which time the sutures were withdrawn.

Many members of the society commended this operation, and some, especially Dr. Dunning and Dr. Ricketts, said that in view of the fact of the author's 169 cases of complete success, that the operation was perfection.

Combined Clinical and Laboratory Study of the Effects of Peritoneal Saline Infusions in Abdominal Operations.—This paper was read by Dr. J. G. Clark, of Philadelphia, who said one-half c.c. of a bouillon culture of the *Staphylococcus aureus* into the abdominal cavity of 25 rabbits without the use of any salt solution and that all of these animals had died within 24 hours, with signs of intense infection. Twenty-five other rabbits were similarly injected, but in these one quart of salt solution was also injected. The investigators were able to save these animals in almost every instance, hence the author still held to the views that he had set forth in his previous paper, two years ago, at St. Paul.

Retroversion of the Uterus.—Dr. L. H. Dunning, of Indianapolis, based his paper upon the study of 112 patients in private practice, only eight of whom had uncomplicated retroversion. The symptoms are more often the result of complication than of the displacement.

Operations upon the Uterosacral and Round Ligaments for Retroversion of the Uterus.—Dr. J. Wesley Bovée, of Washington, D. C., made a further report on this operation. Forty-one patients had been subjected to it since the reading of his former paper with satisfactory results.

(To be Continued.)

SECTION ON PEDIATRICS.

FIRST DAY.—MAY 5TH.

Development of Children.—The chairman, Dr. J. C. Cook, of Chicago, spoke of the hospitality of the city and the welcome accorded to the members. The important question of how to save the lives of the children that they might grow to manhood was one of the most practical in medicine. The gradual modification of the body of the fetus and the variation in the water of the cells was one of the first great developmental modifications, and suggested the weakness of the young. State care was necessary to prevent the premature employment of minors and on this subject he gave many important figures and dwelt particularly on the control of vicious parents by law. Over 100 years ago Peel insisted on the vicious influences of child-labor and English legislators made wise laws. Practitioner should aid the lawyer and protect the minors by framing wise national sanitary laws, which by the appointment of commissioners can be enforced.

Anatomical and Physiological Correspondence of Child and Adult.—Dr. Wm. T. Eckley, of Chicago, pointed out a number of important developmental variations of the child from the adult. These related particularly to changes in temperature, breathing, circulation, nasal sinuses, and myelination of association fibers in brain. Development of pneumatic bones made changes in voice in adults and also increased the danger of infections in these. The author dwelt upon hernias in their relation to development. Myelination of sheaths in nerve fibers is important from pedagogic standpoint. Idiosyncrasy is the survival in the adult of the normal susceptibility of stimulation in the child.

Is the Study of Pediatrics Worth the Attention it Gets, and Does it get the Attention it Deserves?—Dr. C. F. Wahrer, of Fort Madison, Iowa, said that it is to be expected that one working in pediatrics as an exclusive specialty should devote more attention to it than the general practitioner, as it is natural for one to magnify his specialty, but the existence of the pure pediatricist is hardly possible outside the greater cities. Consequently the practice among children receives insufficient attention

throughout the greater part of our country. The young practitioner struggling for a foothold in any community cannot do better than address himself to work among babies and children, since, if he is worthy, he will surely win the confidence and respect of the mothers, and as the children grow older he is established as their family advisor. It is astonishing to note that diseases of children should not receive more careful attention at the hands of the general practitioner, since it comprises not less than half of his routine work. Surely pediatrics deserves vastly more consideration than is commonly accorded it.

Acute Suppurative Cervical Adenitis of Infancy.—This subject was discussed in a paper presented by Dr. T. S. Southworth, of New York. The affection, he said, was peculiar to infancy, and resulted from the absorption of infectious matter through the lymph channels of the nasopharynx. Its onset is sudden, attended by a rapid rise of temperature, followed by diffuse swelling, extending from the ears down the sides of the neck. Suppuration under the usual methods of treatment is to be expected. A continuation of the fever, particularly in the very young, is unfavorable. The prime object of treatment should be the limitation of further absorption of septic material by cleansing the nasopharynx, and putting it in as nearly an aseptic condition as is possible. Should these abortive measures fail to arrest the suppurative process adequate drainage should be established by an incision made with a view to leaving as little cicatricial disfigurement as may be.

(To be Continued.)

LATE NEWS FROM NEW ORLEANS.

Atlantic City, New Jersey, has been selected as the place of meeting for the American Medical Association in 1904. The changes suggested by the Committee on the Revision of the Code of Medical Ethics appointed at the Saratoga meeting, 1902, were considered and finally adopted by the Association.

THE FOURTEENTH INTERNATIONAL MEDICAL CONGRESS.

Held in Madrid, Spain, April 23 to 30, 1903.

[Specially Reported by Cable for the MEDICAL NEWS.]

(Continued from Page 861.)

SECTION ON MEDICINE.

Prof. Lorand, of Carlsbad, read a paper on Diabetes, Acromegaly and Basedow's Disease, in which he spoke of their related pathogenesis. Diseases of the vascular glands are often associated with the glycosuria of Basedow, and glycosuria is invariably associated with hyperactivity of the thyroid body as in chlorosis, poisonings, lactosurea and pregnancy. Thyrodine produces it. Marasmus, myxedema and heredity syphilis are never associated with glycosuria. True atrophy of the thyroid is rare in infancy.

Discussion.—Dr. Castillo, of Madrid, agreed with the points made by the reader as did also Dr. Parkinson. Prof. Lorand said that diabetic patients were improved by the supervision of conditions producing thyroid atrophy, as cancer or tuberculosis of the thyroid. An antibacterial function was inferred from the action of the gland *in vitro*. Hypertrophy was rarely present in tuberculous abscess. The gland swells in infections. Secondary thyroid atrophy in marasmus produces an indurated edema like myxedema and there is a similar loathing of meat.

Clinical Forms of Hyperchlorohydrria was the title of a paper presented by Dr. Thorena of Madrid. The condition is a symptom of some functional, organic or constitutional disease. Its treatment is unsatisfactory and chiefly symptomatic, and relapses are frequent. The diet should be albuminous with no condiments. Alkalies are useful and gastroenterostomy may be required in severe cases with myasthenia, dilatation and inability to diet. Dr. Marogliano of Naples protested that the condition was invariably functional and subject to nervous influences. The symptom is controllable medically and operation is absolutely contraindicated. The profession generally overestimates the importance of HCl.

Luetic Arthritis.—Prof. Singer of Vienna said that the condition was found in the tertiary stage of syphilis and the process was characterized by torpid thickening of the capsule and periosteum and by exostoses. Its duration was one of years but the functional disturbance was usually slight. The diagnosis could usually be made by the absence of fever, the exclusion of an associated endocarditis or gonorrhea. The best results were obtained from the use of the "mixed treatment."

SECTION ON PEDIATRICS.

Artificial Feeding.—Prof. Concetti of Rome said upon this subject that the artificial feeding of infants was inadvisable but occasionally necessary. The natural milk of the mother is never replaced by a perfect substitute. Sterilization of cow's milk and other artificial foods destroys their susceptibility to the action of the digestive ferments and renders assimilation imperfect.

Dr. Raimondi of Paris had been able to secure aseptic milk for the use of 200 children from birth to two years of age. His method was to have the udders of the cows, and the hands of the milkers thoroughly washed in a 1-1,000 solution of bichloride. The milk itself was subjected to no sterilization or alteration, but was given to the children within 20 minutes after it had been drawn. This plan had met with almost invariable success as no digestive disturbance traceable to the food was found among the infants. General congratulations were offered Dr. Raimondi.

Scarlatina.—Dr. Moser of Berlin said that he had used a serum treatment in 142 children. The horses from which the serum was obtained were immunized by a mixture of cultures of streptococci and the heart blood of scarlatina. Seven months were required to complete the immunization. 150 c.c. of the serum produced an exanthematous fever. The use of the serum counteracts the constitutional vomiting, the delirium and reduces the pulse and temperature within one day. Its administration should be begun as early as possible in order to prevent the occurrence of angina nephritis. These complications have been markedly reduced by its use and the mortality lessened one-half. Agglutination of the scarlet cocci is obtained in solutions of 1 to 250,000. Dr. Morfan, of Paris, suggested that cases of scarlatina should be divided into four grades according to their severity. Drs. Latour and Marmorak regarded the serum as useless. Dr. Escherich had had convincing personal experience in its use. His mortality had been lower than that of any other Vienna hospital which did not use the serum.

Paraffin in Umbilical Hernia.—Professor Escherich, of Graz, reported his interesting experience with paraffin injection in the cure of infantile umbilical hernia the treatment of which had heretofore been very unsatisfactory. He had introduced the paraffin at the temperature of 113° F. into the sac of small hernia where it cooled and became firm almost in-

stantly. The result was an immediate narrowing of the sac and contraction of the opening. A radical cure had been uniformly obtained.

Splenic Hypertrophy in Infants.—Professor Morfan, of Paris, presented a paper upon enlargement of the spleen in infants which he usually regarded as a syphilitic interstitial splenitis. It should be differentiated from the enlargement of the organ accompanying rachitic splenoptosis. If associated with anemia it is safe to diagnose hereditary syphilis, despite the absence of other characteristic symptoms.

Serumtherapy of Typhoid Fever in Children.—Professor Josias, of Paris, reported this method of treatment as employed by him in fifty cases. Professor Chantemesse said that the benefits obtained from serumtherapy in typhoid fever were very great and no ill effects had so far been observed. It was a rule to inject 1 c.c. for every 70 pounds of the patients weight unless there was evidence of unusual depression, in which condition a diminished dose was desirable. The effects are a reduction of temperature and pulse rate, an abbreviation of the attack with a diminished tendency to relapses and complications and a remarkable improvement of the mortality rate. A mortality of four per cent. had been obtained under this mode of treatment whereas 14 per cent. was the average rate in other Parisian hospitals.

Dr. Varges, of Madrid, expressed himself as favorably impressed with the serum treatment of typhoid fever and said he was experimenting with an anti-pertussis serum. Professor Josias explained that the Widal reaction was precisely the same in children as in adults. Seventy per cent. gave evidence of agglutination before the tenth day and the reaction was equally as marked before the age of eight as afterward, notwithstanding Kasal found four retarded cases among children. The Widal reaction is unaffected by injection of the anti-serum.

Rhinoscleroma.—Professor Schroetter, of Vienna, said that this, while common in Austria, was never described elsewhere. It must occur in other countries especially in America, as a result of the large Austrian immigration thither. At times it would be found difficult to distinguish it from syphilis or tuberculosis, as it was manifested by nodules, ulcers and cicatrices. Rhinoscleroma is a highly infectious disease and on this account was worthy of governmental inquiry and attention. Professor Garcia, in twenty years' experience as a pathologist, had never encountered an example of the disease in Spain.

Intestinal Therapy.—Professor Bernheim, of Paris, has found the stomach frequently intolerant of many drugs administered in gelatine or reratin coatings which often dissolve while yet in the stomach. By experiments he has found that commercial gluten dissolves in the stomach in about two hours, pure gluten in from three to seven hours and in the intestine in three hours. By the addition of a factive resin the physiological dose may be depended upon to pass through the most delicate stomach without irritation.

Professor Brouardel, of Paris, called the attention to the wide use of salicylic acid as a preservative of food. There was annually manufactured of this drug over 150,000 kilograms, more than enough for all of the rheumatics in the world. Salicylic is a weak and supposedly harmless antiseptic. Large quantities are required in the manufacture of beer, and while in medicinal doses it is ordinarily harmless, the habitual consumption of minute amounts may develop a cumulative effect and bring about very undesirable chronic changes. While an occasional drink of cognac may be innocent, a daily glass will pretty surely excite an arteriosclerosis. The

elimination of salicylic acid or its salts is rapid in the young but it is likely to be slow and even prolonged for days in the aged or infirm and in pregnant women or young children. The effect of repeated minute doses of arsenic is known to be disastrous to the digestive organs, as well as the nervous system. An epidemic of diarrhea, traceable to arsenic, affecting no less than 4,000 persons was cited. Although arsenic is one of the oldest known poisons, its influence when received in minimal doses may escape detection for months. Cases of nephritis and arteriosclerosis are among the effects of salicylic and boric acid upon the weak. Dogs subjected to experimentation with these and similar drugs soon collapse with diabetic paralysis.

Immunization of the Human Against Tuberculosis.—Professor E. Maragliano, of Genoa, said in his address before the general conference that there existed in most individuals a natural immunity against tuberculosis. This fact explains the escape of the large number of persons who are daily exposed to infection. This power of resistance is apparently potent in direct ratio to the standard of good health maintained in the individual. Any decline of the vital strength renders the organism just so much more liable to invasion. The truth of this assertion is confirmed by experimentation upon lower animals and by observation upon the denizens of the tenement districts. The object for which the author had been zealously laboring for thirty years was the establishment of this standard of immunity through improved methods of living and also by the use of an immunizing serum that might be injected hypodermically or perhaps taken by the mouth. Professor Maragliano thought he had made some progress in this direction, as his experiments upon animals had met with sufficient success to justify a trial upon the human.

The Thalamus.—Professor Ramon y Cajal, of Madrid, presented a report of his recent studies upon this important part of the cerebral anatomy. As a result of the investigations of a certain German anatomist, together with his own researches, it was now established that the thalamus was connected with certain sensory tracts as well as with the organs of hearing and vision, and had much wider and more important relations than had heretofore been accorded it.

GENERAL ITEMS.

At the close of the General Session addresses were delivered by representatives of the several nations that had taken part in the Congress. It was regrettable that the committee representing the United States should have been refused admission to the stage at the inauguration of the Embassadors and that our delegate alone failed to deliver his address. In this connection and in explanation of the above-mentioned irregularities it should be stated that the preparation for the accommodation of the scientific and public meetings of the Congress were very inadequate. The Sections were forced to occupy widely separated halls to which there were unsatisfactory means of transportation. Perhaps the most noticeable lack of organization was to be seen in the want of an authoritative bureau of information. Even the committees were unable to tell when or where many of the important proceedings would occur. The social festivities, however, were abundant and enjoyable. Americans especially appreciated the hospitality of Mr. and Mrs. Arthur S. Hardy, the United States Minister to Spain.

Prizes.—At the session held in 1897, at Moscow, that city voted, in honor of the Russian meeting, a prize to be awarded for original research. This was unanimously awarded Professor Metchnikoff. A similar

prize, donated by the city of Paris, was awarded, after a spirited contest, to Professor Grassi. On the first ballot the votes stood Grassi 42, Roentgen 39, Lavan 5.

The next place of meeting will be at Lisbon, Portugal, in 1906, with Professor Alfredo da Costa, of that city, as President.

(To be Continued.)

BOOK REVIEWS.

MECHANICAL VIBRATORY STIMULATION, its Theory and Application in the Treatment of Disease. By MAURICE F. PILGRIM, M.D., First Vice-President of the American Electrotherapeutic Association, etc. Published by Metropolitan Publishing Company, New York.

For some years now there has been a definite impression among medical men that has spread also somewhat to the general public that mechanical stimulation by means of vibration may be of service in the treatment of various nervous and muscular diseases. This little book gives a very full account of the possibilities and the technic of this new method of therapeutics. As is to be expected, perhaps there is somewhat of overenthusiasm in the claims of benefit to be derived from the method, but on the whole the book is a very fair presentation of the new subject. The details of the method are given a thoroughly scientific treatment and there is evidently a definite purpose to be helpful to medical men rather than merely to attract the public attention. The book is therefore deserving of careful reading by those who feel interested in this branch of physical therapeutics.

CLINICAL TREATISES ON THE PATHOLOGY AND THERAPY OF DISORDERS OF METABOLISM AND NUTRITION. By Prof. Dr. CARL VON NOORDEN, Physician-in-Chief to the City Hospital, Frankfurt a. M. Part III, Membranous Catarrh of the Intestines (Colica Mucosa). E. B. Treat & Company, New York.

PROFESSOR VON NOORDEN treats this difficult subject in a very masterly manner. As some of the best original observations with regard to the forms of the disease originate with himself, this little book is sure to be helpful in a very practical way to the physician. His treatment particularly is very detailed, including even the exact quantity and quality of diet advised under varying circumstances, and the monograph concludes with a review of 76 cases that have been reported up to date. In these incomplete success was attained in about 16 per cent., permanent success in 50 per cent., there were relapses in 13 per cent. and failure in only 5 per cent. It is evident that Prof. von Noorden's opinions in the matter deserve to be carefully read.

MEMORANDA ON POISONS. By THOMAS HAWKES TANNER, M.D., F.L.S. Ninth revised edition. By HENRY LEFFMANN, A.M., M.D., Professor of Chemistry in the Woman's Medical College of Pennsylvania, Pathological Chemist Jefferson Medical College Hospital, etc. P. Blakiston's Son & Co., Philadelphia.

This book is already so well known that an extended notice of this ninth edition is scarcely necessary. The poisons are classed as corrosives, simple irritants, specific irritants and neurotic poisons, and an appendix relates to bites and stings. It seems strange that atropine should not be mentioned in the treatment of toad-stool poisoning. In some cases, as with formaldehyde, digitalis, veratrum, the poisonous dose is not stated.